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AN INTRODUCTION TO THE PREHISTORY OF THE PEACE RIVER COUNTRY

by

(C) Hugh Ross Thomson

A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES AND RESEARCH

IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE

OF MASTER OF ARTS

DEPARTMENT OF ANTHROPOLOGY

EDMONTON, ALBERTA

FALL, 1973

THE UNIVERSITY OF ALBERTA

FACULTY OF GRADUATE STUDIES AND RESEARCH

The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies and Research, for acceptance, a thesis entitled "An Introduction to the Prehistory of the Peace River Country" submitted by Hugh Ross Thomson, in partial fulfilment of the requirements for the degree of Master of Arts.

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Date March 28, 1973

ABSTRACT

Following a description of the physical environment and of the material culture of the historic native inhabitants of the Peace River Country, is a presentation of data gleaned from archeological research conducted during the summers of 1969 and 1970.

In 1969 an archeological survey of the Saddle Hills resulted in the discovery of 36 sites. It became apparent that the larger, more prolific sites in this area are distributed above 2500 feet ASL. Sites found below this elevation contain relatively little lithic material constituted largely of imported chert.

In 1970 a portion of the Ski Hill site (GiQq 301) was excavated. In addition, a controlled, complete surface collection was secured from 10,500 square feet of the cultivated portion of the site. The materials recovered from this site are analyzed and compared with those from other northern sites.

The available radiocarbon dates from farther south in Alberta and in Saskatchewan associated with projectile points similar to those recovered from the Ski Hill Site suggest that the major utilization of this site was during the third millennium B.C.

ACKNOWLEDGEMENTS

This endeavor is the result of the efforts and encouragement of many people. I wish first to thank the Provincial Museum and Archives of Alberta and the University of Alberta for successive grants in 1969 and 1970 which enabled me to carry out this research; and in particular, Mssrs. B. McCorquodale and R. Kidd of the Provincial Museum for their interest and cooperation during the field work.

I wish also to thank the Town of Sexsmith which generously provided us with living quarters and laboratory space during the 1969 field session.

Among the individuals who contributed to this project are crew members John Peck, Christine McCulloch, Ken Arnold, Harvey Diduch, and eleven introductory students who provided the energy required to accomplish the complete surface collection. Robson Bonnichsen and Archie Landals provided valuable technical assistance in the production of the plates and maps included in this report.

I am especially grateful to landowners Conrad Wrzosek and Frank Plahta for permission to excavate the site and to the Plahta family for their intense cooperation and continuing interest in the project.

Finally, I wish to thank Dr. Alan Bryan who has provided me with instruction, guidance, and research opportunities throughout my university education.

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CHAPTER I

INTRODUCTION

The following report on Peace River prehistory is based upon the study of one extensive but non-stratified archeological site in Saddle Hills near the center of the open prairie portion of the Peace River country. Excavation of the site is described and the cultural materials recovered are discussed in relation to assemblages from other excavated sites in central and northern Alberta.

Knowledge of Peace River prehistory is extremely limited. In fact, the Ski Hill site (GiQq 301) is the only intensively investigated site in the entire region. The archeological data presented in this report then, suffer from two handicaps: the nature of the site; and of my own research techniques, which had to be developed to handle sites lacking stratigraphy. For the latter I assume full responsibility. As to the former I can only say that of the approximately 100 sites known in the Peace River country, only one presents a possibility of discerning any vertical separation of cultural materials. The remainder, including the Ski Hill site, are 'surface sites', all of which have been disturbed by plowing to some extent. Almost certainly these shallow, unimpressive sites will have to be the major source of information concerning prehistoric life in this

region.

The primary aim of this research is to identify patterns of utilization of natural resources employed by prehistoric inhabitants to secure subsistence in the Peace River country. Unfortunately the limitations of the available archeological data are severe. Selected ethnographic data is presented here as a source of analogue data to supplement the information gleaned from analysis of the lithic materials from GiQq 301. For a more complete ethnographic sketch of the Beaver Indians see: Morice (1889, 1894, n.d.), Harmon (1957), Goddard (1916), Jenness (1937), and Ridington (1968).

The shallow nature of the Ski Hill site mitigated against the recovery of materials suited to the radiocarbon method of dating. In surface sites such as this one, these materials (where they are preserved) are subject to contamination by the percolation of surface water, by root intrusion, by frost action, and by fire. At GiQq 301 we were not able to distinguish with any degree of certainty between recent and prehistoric carbon. In the areas of excavation charred and uncharred roots and wood permeated the site.

One potential method of dating surface sites is by obsidian hydration. Two samples of obsidian collected from the surface of the ploughed field (Fig. 3 p.102) were submitted to Mr. Paul V. Aiello, Malibu, California for hydration measurments. Until a relevant hydration rate has been established for this area, however, absolute calendric

dates cannot be assigned to these specimens. The measurements are included here against the eventual establishment of an hydration rate for northern Alberta:

OHL #	Microns of Hydration
1601	3.1 ± .2
1602	2.8 ± .2

Aiello does suggest on the basis of these measurements that the two specimens are "essentially contemporaneous" (P.V. Aiello, per. comm., 1971).

The conclusions drawn in this paper are based on archeological evidence derived from within the Peace River country and on the observations of early explorers, traders and ethnographers who were also in this area.

Previous Research

In 1956 E. Mott Davis, working for the Glenbow Foundation of Calgary and in cooperation with H.M. Wormington, tested four of the sites he had located in the Peace River country. He recovered evidence of human occupation, scattered flakes and bone fragments at two of these sites. A single diagnostic artifact, ". . . one small, unnotched triangular arrowpoint made on a thin flake. . ." was recovered from HbQh-2, two miles north of Peace River (Wormington and Forbis, 1965:180). Selected projectile points and bifaces of eight private collections recorded at this time are illustrated in Wormington and Forbis (1965).

In 1964 J.V. Wright and W. Noble of the National Museum of Man conducted a survey of the Peace River valley and adjacent plateaus from approximately thirty miles southwest of the town of Peace River, north of Manning, Alberta. They located forty-two archeological sites.

Also in 1964 A.L. Bryan and R. Gruhn of the University of Alberta visited northwestern Alberta. They located five archeological sites in the south Peace River country. In 1968 Dr. Bryan returned to the area with one assistant and salvaged a portion of the Karpinsky site, GkQn 100, near Wanham, Alberta.

In 1966 R. Kidd of the Provincial Museum and Archives located site GlQo 300, south of Fairview, Alberta on the Peace River. He returned again in 1969 and tested the site.

Although other archeologists have passed through the area and recorded sites and private collections, the aforementioned projects represent the total professional research efforts in the Peace River country. With the exception of Davis' work reported in Wormington and Forbis (1965), none of the above mentioned work has been published.

My own research began in 1969 when, under the auspices of the Provincial Museum and Archives and the University of Alberta and with the able assistance of John Peck, I conducted a systematic survey of the Saddle Hills in the south Peace River country. During our stay we located thirty-six archeological sites; of these we tested eight.

On May 1, 1970, under the same joint sponsorship, I returned to the Saddle Hills with four crew members to excavate some portion of the Ski Hill site, GiQq 301.

I returned once again to the site in the fall of 1971 with one veteran crew member and eleven students from my Introductory Anthropology class. In one weekend, we secured a controlled, complete surface collection of 10,500 square feet of the ploughed field adjacent to our excavations of the previous summer.

The following report is based in part on this background of archeological research.

Definition of Study Area

The boundaries of the "Peace River Country" have been variously defined in the literature depending upon the focus of the particular study (Kitto 1930, Moss 1952, Jones 1966). For all authors however, the Peace River country refers generally to that portion of the drainage basin of the Peace River between Hudson Hope, British Columbia, and Fort Vermillion, Alberta and to ". . . those contiguous areas allied with it in general physical characteristics" (Kitto, 1930:3). This area lies about 250 miles northwest of Edmonton, Alberta.

The Peace River country has been alternately termed an "oasis" (Horetzky, 1874:46) and a "poor man's land" (Macoun, 1904:40) by travellers throughout historic times. Such apparently contradictory appraisal is not entirely

unfounded, for the Peace River country is a land of extremes. Although crops of wheat of 60 bushels to the acre have been harvested so too have farmers been rained out, snowed out, dried out, and hailed out. Nevertheless, the Peace River country is known primarily as a farming district. The distribution of farming activities in this area ". . . relates closely to the parkland areas, with their native grassland and dark, rich soils, for these areas attracted the early settlers and they still support the bulk of the population of the entire region" (Moss, 1952:99).

It is the contention of this thesis that the historic fact of a broader possible economic base in the Peace River country as opposed to the surrounding dense forested areas obtained during some portion of prehistoric time as well. The Peace River prairies, as they were the preferred habitat of the buffalo, could have supported a larger popluation than the surrounding boreal forest, with the possible exception of those major fisheries, such as Lesser Slave Lake and Lake Athabasca.

Although the limited research done to the present cannot prove this contention, I will suggest on the basis of this research, further problem-oriented research projects which may shed some light on the subsistence patterns of the prehistoric inhabitants of this region.

CHAPTER II

HABITAT

SURFICIAL GEOLOGY

The upper portion of the bedrock predominant in the study area is of Upper Cretaceous age. The Wapiti Formation, consiting ". . . mainly of frehswater, thick-bedded sandstones, shaly sandstone, and shales," (Henderson, 1959:16) caps the bedrock core of the Saddle Hills and underlies the area to the south of the hills. The shale and minor sandstone of the Smoky River Group, a marine formation, underlies the area north of the Saddle Hills to the Peace River valley (Atlas of Alberta, 1969:7-8).

During the Pleistocene, Laurentide Ice advanced into the area three times, each time depositing a mantle of till over the bedrock (Henderson, 1959:19). The oldest of the till sheets is only infrequently exposed in the Peace River country; one of these locations lies at the northern base of the Saddle Hills near Woking, Alberta (Henderson, 1959).

> It is yellow-brown to brownish grey and contains more pebbles and stones than either of the younger tills overlying it (Ibid.:19).

The second ice advance overrode the Saddle Hills and deposited a thin covering of ground and hummocky moraine till. This glacial deposit ". . . consists of a greyish brown to yellowish brown, sandy clay loam to clay till, that is somewhat stony, has numerous coal flecks and

may be largely derived from both the Smoky River and Wapiti formations" (Odynsky, Wynnyk and Newton, 1956:25). This intermediate till forms the parent material of the upland soils in the survey area. The soil in the vicinity of the Ski Hill site is particularly stony, more so than characterizes this parent material. Henderson (1959:20-22) explains that the hills were the first areas exposed by downmelting of the ice; and that coarse materials, including quartzite pebbles and cobbles, were concentrated in such areas by the meltwater action.

The third and youngest till ". . . consists of a well sorted, grey to dark greyish brown clay that has few stones, numerous gypsum crystals and may be derived largely from the weathered products of the Smoky River shales" (Odynsky, et al.:25). Henderson (1959:87) concurs:

> . . . the top till, which is of local extent, was laid down during a stadial readvance in which the ice occupied only the lower parts of the area. The thin top till consisted largely of lacustrine clays and silts laid down in the proglacial lakes that were in the area during much of the ice-free interval that existed prior to its deposition. The presence of these lakes is inferred from, among other things, the unusually high clay content of the youngest till.

This till does not occur above approximately 2500 feet ASL in the vicinity of the Saddle Hills (Odynsky, et al.:25).

A spillway related to the proglacial lake(s) in the Peace River country (Lake Peace), has been identified about 30 miles west of Grande Prairie, Alberta.

> Stelck has identified a spillway (sill about 2625 feet elevation) draining into the upper Wapiti River basin through Tupper Creek-Swan Lake-Beaverlodge River.

> No other outlets related to the indicated high water levels are known (Taylor, 1960:173).

The elevation of the Ski Hill site is 2770 feet ASL. Neither the site nor the main body of the Saddle Hills was covered by glacial Lake Peace. Beach deposits formed by proglacial lakes are generally thin and discontinuous and consequently difficult to trace. The present author did note sand deposits exposed in two excavations near the site at elevations estimated between 2500 and 2600 feet ASL. Research into the extent and duration of glacial Lake Peace is continuing.

The map area (Fig. 1, p.100) was entirely free of ice and water by 8000 years (Atlas of Alberta, 1969:12).

Physiography

As a result of the Late Pleistocene events described above, the Peace River country is an area of relatively low relief, particularly north of the Peace River valley. Relief in the south half of the Peace River region is somewhat greater due to the presence of unlands such as the Saddle and Birch Hills. Disregarding the postglacially incised valleys of the Peace, Smoky, and Wapiti Rivers, the maximum relief in the Peace River country is about 1200 feet (Henderson, 1959:13).

Jones (1966:6) identifies three physiographic units within the Peace River country:

> These are: (1) forested and rolling uplands and (2) broad, gently sloping prairies below the uplands, which are cut into by (3) deeply incised, steep-sided river valleys.

The archeological survey which resulted in the location and excavation of the Ski Hill site was focused primarily on the transition zone between the forested uplands and the surrounding prairies because theoretically this zone would have offered the greatest range of food resources.

The frequent lakes, ponds and sloughs scattered throughout the Peace River prairies are remnants of previously existing, larger proglacial lakes. Due to the unconsolidated nature of the prevalent surface deposits and the shallowness of the lakes, many of these bodies of water are filling in rapidly. Their margins would have provided mixed, biologically rich habitats.

Climate

Alberta lies within the northern cool temperate climatic zone. The climate of the province is continental and is characterized generally by cold winters and short, cool summers. Longley (1967:67) describes some climatic variation within the province:

> Alberta's cool temperate zone is divided into two sub-zones: one has a short cool summer; the other has a somewhat longer cool summer in which the period with a mean temperature over 50 degrees is four months long.

The Peace River country is unique in that it is an isolated area of longer, cool summers within the short, cool summer sub-zone (Longley, 1967:67).

Temperature. The average maximum temperature in July, the warmest month, calculated over a thirty year

period is between 70° and 75° (F). The average minimum temperature in January, the coldest month, is between -5° and -10° (F). The mean annual temperature range in the map area is between 55° and 60° (F) (Atlas of Alberta, 1969:14).

Between 1955 and 1964 there were less than 10 winter days with a maximum temperature above 40° (F); over the same period there were 15 to 25 summer days with a maximum temperature above 80° (F) (Atlas of Alberta, 1969:15).

Mr. E. Stashko, Fire-Weather Meteorologist for the Alberta Forest service, provided me with the following normal maximum temperatures recorded over a period of eight years (1963-1970) at the White Mountain Forestry Tower on the highest point in the Saddle Hills, and at the town of Spirit River 25 miles north on the edge of the Peace River Lowlands.

Spirit River	Month	White Mtn.
47.0° (F)	April	40° (F)
62.5° (F)	May	55° (F)
67.5° (F)	June	60° (F)
72.5° (F)	July	65° (F)
71.0° (F)	August	65° (F)
62.0° (F)	Sept.	55° (F)

It appears from these figures that the normal maximum temperatures from April to September are 6° (F) to 7.5° (F) higher on the lowlands than on top of the Saddle Hills. Although there are no similar figures available for the months of October to March, Mr. Stashko (per. comm., 1970) suggests the reverse would be true in winter because the heavy cold air sinks into the lowlands.

The latest spring frost between 1951 and 1964 occurred between May 15 and May 31 over most of the area. The first fall frost over the same time period occurred between September 1 and September 15. The frost-free period in the south Peace River country lasts from 80 to 100 days (Atlas of Alberta, 1969:15).

Extreme winter temperatures, below -30° (F), may be expected each year for a period of 10 to 15 days sometime in January or February. Fort Vermilion, in the north of the Peace River country, has recorded -78° (F), the second lowest temperture ever recorded in North America (Fuller, 1967:174).

Precipitation. The average annual precipitation at Grande Prairie established over nine years of observations is 15.97 inches (Odynsky, Wynnyk and Newton, 1956:19). Sixty-four per cent of that total falls between April and September (Odynsky et. al.:19). As with the temperature there is some variation in precipitation amounts between the Saddle Hills and the surrounding lowlands.

Spirit River	Month	White Mtn.
1.50 inches	May	2.0 inches
2.00 inches	June	3.0 inches
2.00 inches	July	2.5 inches
1.50 inches	August	3.0 inches
1.75 inches	Sept.	2.0 inches

From May through September one quarter to one and one half inches per month more precipitation falls in the Saddle Hills than on the lowlands (E. Stashko, per. comm., 1971).

Although no range has been established for snowfall in winter, Mr. Stashko suggests that probably half again as much snow falls in the hills as falls on the lowlands. The average annual snowfall at Grande Prairie is 70 inches (Odynsky, et. al.:19). We might expect then that approximately 100 inches of snow will fall in the Saddle Hills over a winter. Snow has been recorded in the Grande Prairie region south of the Saddle Hills in every month but July.

Wind. The prevailing winds in the map area (Fig. 1, p.100) are from the west (E. Stashko, per. comm.,1970). The following data was recorded at the Grande Prairie weather station.

Month	Ave. mph	Direction
Jan	5.0	W, NW
Feb	5.3	W, NW
Mar	5.6	W, NW
Apr	7.7	W, E
May	8.4	W, SW
Jun	7.6	W, SW
Jul	6.8	W, SW
Aug	6.9	W, SW
Sept	7.5	W, SW
Oct	7.3	W, SW
Nov	5.0	W, NW
Dec	5.4	W, NW

Most calm days are in the winter months. The summers are relatively windy.

Frequent outbreaks of arctic air from the Yukon provides the map area (Fig. 1, p.100) with most of its weather throughout the winter months. Periodic arctic outbreaks are interspersed with outbreaks of milder air from the Pacific

Ocean. These "Chinooks" are facilitated by relatively low mountain ranges in British Columbia at that latitude. Chinooks are a regular occurrence from year to year in the Peace River country and are a periodic occurrence in any given year (E. Stashko, per. comm., 1970). Chinooks greatly reduce the amount of accumulated snow in the area. In February, 1971, following a chinook, the present writer observed that large areas of the Ski Hill site were free of snow. Quartzite pebbles and cobbles were exposed on the surface.

Paleoenvirontmental Research

The Peace River country is somewhat anomalous in that it embodies fairly extensive areas of open grassland ". . . associated with poplar and willow groves . . ." (Moss, 1955: 515), approximately two hundred miles north of the southern limit of the boreal forest. Explorers and scientists alike have long speculated on the origin and the factors contributing to the perpetuation of these and other northern grasslands.

Sigrid Lichti-Federovich (1970) has reported on a lake sediment section recovered from Lofty Lake, 250 miles east, southeast of Grande Prairie, Alberta. Although Lofty Lake is somewhat removed from the area under investigation, the results of her research must be taken into account in any consideration of the origin of northern grasslands.

With one exception--the L4 assemblage (ca. 7480-3500 years B.P.)--Lichti-Federovich discovered no significant

variation in the low percentages of non-arboreal pollen at Lofty Lake. She does not interpret the relatively high percentage of NAP in L4 as representing a grassland environment:

> The assemblage shows values of non-arboreal pollen from 20 to 40% of the sum, but these values are not high enough to warrant interpretation in terms of extensive grasslands surrounding the site. The studies of modern pollen cited above, suggest that grassland sites normally yield total non-arboreal frequencies of at least 60%. It is suggested that the vegetation resembled the modern mixedwoods, with the important exception that the boreal element (spruce, larch and fir) was rare or absent. The chief trees were birch and poplar, with very local jackpine, and xeric sites (south-facing slopes and dry summits) bore local grassland communities. An alternate explanation of the non-arboreal frequencies is that the boundary of the grassland zone was further north than its present position, perhaps less than 161 km (100 miles) from Lofty Lake site, contributing a larger fraction of herb pollen to the pollen fall-out than at present . . . (Lichti-Federovich, 1970:942).

Lichti-Federovich (1970:944) concludes:

> Moss (1952, 1955) suggests that the northwestern prairies "might well be remnants of a very extensive grassland which occupied much of the region during the xerothermic period and might even have been connected with the main parkland of south-central Alberta." However, Raup (1934, 1935) speculates that these northern prairies in the Peace River region developed independently from subarctic non-arboreal communities. A recent version of this phytogeographic problem by Webb, et. al. (1967) envisages that "The Peace River prairie is a relict of a time when grassland reached unbroken from the south to the far north of its present frontier." The evidence from the Lofty Lake site suggests strongly that Raup's opinion is correct, and that there was never a connection during the Late Pleistocene between the main southern grasslands and the northern grasslands of the Peace River area.

Dr. Harvey Nichols of the University of Colorado has recovered a single core from north of Grimshaw, Alberta (56° 17' N. lat., 117° 20' W. long.) in the Peace River country.

He has offered the following "preliminary and very tentative" interpretation of a single completed pollen diagram:

> The basal organic date is 6880 ± 85 BP and from then until 4510 ± 70 BP there was a good deal of pine and spruce pollen, probably indicative of an open boreal forest. From 4510 ± 70 to 3590 ± 75 BP there were large amounts of grass pollen, which may have reflected merely local grassland or a larger regional change. After 3590 there was increased spruce pollen, with higher values after 2620 ± 60 BP, when there was a moderate number of sphagnum spores recorded--I judge this to have been the reflection of cooler and wetter climate (i.e. after 3500 and 2600 BP). This last episode of open spruce and pine forest appears to have lasted until modern times, when there was reduced spruce pollen. I might add very tentatively that this sequence may have resulted from a quasi-latitudinal movement of the southern limit of forest-grassland in phase with the shifts recorded at the forest-tundra ecotone (Nichols, per. comm., 1971).

Analysis of pollen cores from several additional sites in the Peace River country is necessary to determine the extent of the changes in vegetation postulated by Nichols.

In addition to climatic change, edaphic factors are considered to have exerted some influence on the distribution of northern grasslands:

> It is noteworthy that many of these parklands are found on soils that have developed on a heavy, somewhat saline parent material, and are distinguished by a clay pan that is relatively near the surface. Such a clay pan might tend to be unfavourable to the development of a good tree growth and it is suggested that, as a result, trees never did become well established in such areas (Odynsky, et. al.:24).

Palynological research in areas exhibiting a clay pan and/or relatively saline soils, will determine whether or not these edaphic factors have effectively inhibited the expansion of tree cover since deglaciation.

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Palynological research in areas exhibiting a clay pan and/or relatively saline soils, will determine whether or not these edaphic factors have effectively inhibited the expansion of tree cover since deglaciation.

Moss (1952) emphasizes the role of fire in maintaining the northern grasslands. References to fires and/or fire blackened areas in the Peace River country during the fur trade era are very common (for example, Mackenzie (1970), Harmon (1957), McDonald (1970), and Macoun (1904)).

Charcoal is found either in bands or widely dispersed in virtually every soil column from the Peace River country--including the one from the Ski Hill site (Dr. B. Proudfoot, per. comm., 1973).

La Roi (1967:168-169) suggests that repeated fires have exerted selective pressure on forests such as those common to the uplands of the Peace River country:

> The volume of inflammable material is much less in the aspen forest, because decomposition rates usually keep up with accumulation rates, thus preventing the formation of thick litter and duff layers. Crown fires, too are almost unheard of, for the leaves and branches of aspen are much less readily burned than are those of spruce. As a result, fires do not last long or travel fast in the aspen habitat, even after prolonged drought. Furthermore, after racing through a spruce forest, fires are frequently deflected or halted along the aspen forest margin.
>
> As a rule, however, surface fires generate sufficient heat to kill the aspen tree tops indirectly, by girdling their trunk bases. But such fires are either not hot enough or are of insufficient duration to kill the subterranean parts of aspen and many of its associated species. Within weeks, in great contrast to the spruce forest, most of the plants of the aspen forest push forth vigorous sprouts, and virtually the entire community is rebuilt in less than 30 years. Under such conditions, the opportunity for successful seedling invasion is slim indeed.
>
> Significantly enough, white spruce is not among those species which are able to regenerate vegetatively from surviving root systems. Thus at any time in the slow process of succession from aspen to spruce, the incidence of fire is disastrous for the spruce and a boon to the aspen.

> In the mixedwood mosaic forest, fire may be intense in the pockets of pure spruce but light elsewhere. If so, then the aspen may expand at the expense of spruce, or the spruce may successfully re-establish itself in its old haunts by seed from unburned crowns or from nearby individual spruce trees which escaped the fire because of protection by aspen. We may therefore be pardoned for speculating that the mixed wood forest, the most common upland forest in Alberta's boreal taiga, is an evolutionary adaptation to fire, at the community level of biological organization.

In support of this hypothesis, stands of aspen-dominated mixed wood forests in the study area are rarely older than approximately 60 years and therefore, in all probability, represent the fire climax vegetation type for this area (Dr. V. B. Proudfoot, per. comm., 1973).

Expansion of the tree cover since the cessation of fires in the Peace River country has been inhibited by expanded agricultural development. Where farming activities and fire have not interfered with the native vegetation cover, poplar quickly establishes itself on open grassland.

These observations indicate that fire has influenced the distribution of grassland in the Peace River country for at least as long as the present climatic conditions have prevailed. It is necessary then, to consider the possibility that fires were deliberately set by native inhabitants in order to preserve the grasslands and provide grazing for game animals.

Intentional burning for this purpose was recorded among the Indians of the Upper Tanana River in the boreal forest of Alaska. These people have, in common with the

Beaver Indians of the Peace River country, an economy based in part upon moose hunting. R. A. McKennan (1959:49) states:

> Since moose prefer to browse on young willow shoots, hillsides were periodically burned to provide feeding places for the animals.

R. F. Leslie (1968:129) recorded part of a conversation he had with a white-educated Beaver Indian while camped on Takla Lake in north-central British Columbia:

> My friend, the area burned over now becomes dynamic grassland and brushland for many years. Grass supports a larger animal population than forest duff. For Indians hunting meat and hides, open land means abundance." Never taking his eyes off mine, he paused to let the idea sink in before proceeding.
>
> I had to acknowledge that there was some advantage from the standpoint of the Indians. He reemphasized the fact that the sterile, shady forest produced nothing in the way of food which could support an ungulate. There were no cities to be flooded when the snow melted; stream pollution from rapid runoff from the ravished hills would settle out in the lakes. Trout, salmon, and grayling, according to Larch, would be set back for but two spawns . . .
>
> "When I was a child, it was such fun to follow my father and other members of the tribe during early fall when they made a feast of controlled burning! Indians never burned big timber. Their purpose was to improve the range. The mills had laws passed to stop us from all burning, but our Thunder God took over and now destroys a vast acreage of big timber. Since the Indians are not allowed to burn the understory, it has become dense enough to ignite the big trees once it is set by lightning."

The Beaver Indians did, in recent historic times, intentionally burn portions of their territory in order to preserve grasslands for game animals. The reference to salmon in the above quotation indicates that during this time, the Beaver occupied an area approximately 200 miles west of the present limits of the Peace River grasslands.

Further palynological research is required to demonstrate whether fire or some other edaphic factor, i.e., soil salinity and/or clay pan, has been the primary influence in maintaining the Peace River grasslands. Analysis of pollen cores taken from areas exhibiting the latter characteristics may resolve this problem.

Present research indicates that the distribution of grassland and forest in the Peace River country has fluctuated since deglaciation. Dr. V. B. Proudfoot (per. comm., 1973) suggests that polen analysis is the only reliable means of determining past distributions:

> Whereas we know a black grassland soil is 'degraded' relatively quickly by invading trees, we do not know how long it takes to establish black soils, hence the distribution of grasslands will always be uncertain from soil and historic vegetation evidence.

Reliable interpretation of archeological data from the Peace River country will be severely limited until we are able to relate artifact assemblages to specific environmental contexts.

Flora

The present vegetative cover of the study area varies with the physiography. Uplands, such as the Saddle Hills, are covered by an aspen-dominated mixed wood forest in the east varying to a spruce-dominated mixed wood forest in the west. Contained within this forest are several muskeg and treed muskeg areas. "Black spruce, tamarack, scrub birch, labrador tea, sedges, rushes, reeds, coarse

grasses and mosses occur in the many low-lying, poorly drained portions of the area" (Odynsky et al.:22). Parkland, consisting of ". . . wooded bluffs, low shrub cover and varying amounts of open grassland" (Ibid.:22) covers the lowlands to the north, east and south of the hills. With the exception of the effects of local topographic and climatic conditions, the elevation of the parkland-mixed wood forest ecotone lies between 2600 and 2800 feet ASL along the south slope of the Saddle Hills and between 2400 and 2600 feet ASL along the north slope.

The constituents of the mixed wood forest are (R. Hosie, 1969):

trembling aspen	(Populus tremuloides)
balsam poplar	(P. balsamifera)
black cottonwood	(P. trichocarpa)
white spruce	(Picea glauca)
black spruce	(P. mariana)
lodgepole pine	(Pinus contorta)
jack pine	(P. banksiana)
tamarack	(Larix laricina)
balsam fir	(Abies balsamea)
alpine fir	(A. lasiocarpa)
willows	(Salix spp.)
white birch	(Betula papyrifera)
Alaska birch	(B. neoalaskana)
water birch	(B. occidentalis)

speckled alder	(Almus rugosa)
mountain alder	(A. incana)
saskatoon-berry	(Amelanchier alnifolia)
choke cherry	(Prunus virginiana)
pin cherry	(P. pensylvanica)
kinnikinik	(Arctostaphylos uva-ursi)

Each of the above occurs ". . . either in mixtures or as the dominant cover of local areas" (Odynsky et. al., 1956:22).

The relatively open canopy of the aspen-dominated mixed wood forest allows for the development of an abundant shrubby and herbaceous understory. The following wild fruits are differentially distributed throughout this understory:

raspberry	(Rubus strigosus)
currants	(Ribes sp.)
cranberry	(Viburnum sp.)
gooseberry	(Ribes sp.)
strawberry	(Fragaria)
blueberry	(Vaccinium sp.)
soapberry	(Shepherdia canadensis)

The Ski Hill site is located on the top of the south slope of the Saddle Hills five miles northeast of Sexsmith (Fig. 1, p.100). From the site one can scan to the south one of several prairies in the Peace River country. Moss (1952: 102) considers these grasslands a single "ecological category":

> Comprising the Agropyron-Stipa-Carex community are three subtypes or faciations: (a) Agropyron-Carex,

(b) Agropyron-Stipa, (c) Stipa. Of these, the Agropyron-Stipa faciation is the prevailing one, making up most of the grassland under consideration. It occupies flat, gently undulating, and rolling areas, characterized by mesic grassland habitats. The Agropyron-Carex faciation is confined to low, moist, flat areas, while the Stipa faciation occurs on dry, steep, south-facing slopes of knolls and river valleys.

The south slope of the hills, including a portion of the site, is a xeric habitat; the grassland of this area is of the Stipa faciation. The top of the hills in this area forms a broad, flat plateau covered by vegetation of the Agropyron-Stipa faciation. Following is a list of the flora collected from the Ski Hill site and identified by Dr. Thelma Habgood. Dr. Habgood (per. comm., 1970) noted that most of the specimens were unusually small, probably due to the strong prevailing winds on that surface.

Galium boreale
Solidago sp.
Erigeron sp.
Potentilla concinna
Fragaria virginiana
Artemisia frigida
Oxytropis sp.
Antennaria parviflora
Geum triflorum
Lilium sp.
Thalictrum sp.
Achillea millefolium
Androsace septentrionalis
Viola adunca
Ranunculus rhomboideus
Anemone patens
Stellaria crassifolia
Zizia aptera
Populus tremuloides
Salix sp.
Amelanchier alnifolia
Arctostaphylos uva-ursi
Symphoricarpos albus
Rosa acicularis

Trifolium sp.

Sedum integrifolium

Maianthemum canadense

Taraxacum sp.

Phleum pratense

Cruciferae sp.

The dominant native vegetation in the immediate vicinity of the site is of the parkland variety. Two clones, one predominantly of poplar the other of willow, cover a portion of the site. These bluffs are surrounded by open grassland, a portion of which is under cultivation. The remainder of the grassland is presently used for pasture.

Mr. W. Brown of Grande Prairie had a homestead just below the Ski Hill site in 1914. He told me that 60 years ago there were no trees on the site at all. This apparent expansion of the tree cover is continuing. Where they have not been checked by fire or by farming activities, poplar saplings extend outward from the mature stand 30 to 40 feet. This change in vegetation cover is reflected in the soils.

The soil at the site is developed on a glacial till derived from the Wapiti Formation (Odynsky et. al.:30-31). The column retrieved from the site has a degraded black solonetz profile and is transitional in nature between the dark and gray soil groups.

Fauna

Frequent variation in vegetative cover over relatively short distances has characterized the Peace River country for some time, possibly since deglaciation. The advantages accruing to the inhabitants of ecotones such as this, in terms of the amount and variety of food resources available have been sufficiently discussed elsewhere (Odum 1965, Cleland 1966) so as to warrant no further explication here except as they apply to the study area.

The Peace River country supports a wide variety of fauna. Mammals indigenous to this area include (Soper, 1964):

varying hare	Lepus americanus macfarlani
Canada woodchuck	Marmota monax canadensis
Mackenzie red squirrel	Tamiasciurus hudsonicus preblei
Hudson Bay flying squirrel	Glaucomys sabrinus sabrinus
Canada beaver	Castor canadensis canadensis
northwestern muskrat	Ondatra zibethicus spatulatus
Alaska porcupine	Erethizon dorsatum myops
northwestern coyote	Canis latrans incolatus
northwestern timber wolf	Canis lupus occidentalis
British Columbia wolf	Canis lupis columbianus
British Columbia red fox	Vulpes fulva avietorum
American black bear	Euarctos americanus americanus
grizzly bear	Ursus arctos
Alaska marten	Martes americana actuosa
British Columbia fisher	Martes pennanti columbiana

Hudson Bay mink	*Mustela vison lacustris*
American wolverine	*Gulo luscus luscus*
Mackenzie otter	*Lutra canadensis preblei*
Canada lynx	*Lynx canadensis canadensis*
Rocky Mountain wapiti	*Cervus canadensis nelsoni*
Rocky Mountain mule deer	*Odocoileus hemonius hemonius*
white tailed deer	*Odocoileus virginianus*
moose	*Alces alces*

In early historic times explorers and traders observed, in addition to those listed above, herds of buffalo (*Bison bison bison* and *Bison bison athabascae*). Just above the juncture of the Beatton and Peace Rivers, Mackenzie (1970: 263-264) noted in 1792:

> Some parts, indeed, offer a beautiful scenery, in some degree similar to that which we passed on the second day of our voyage, and equally enlivened with the elk and the buffalo, who were feeding in great numbers, and unmolested by the hunter.

The open grasslands adjacent to the present-day towns of Grande Prairie, Sexsmith, Spirit River, Fairview, and elsewhere must have been the preferred habitat of the buffalo. By 1830 however, the Indians, inspired by the acquisition of the gun and the demands of the fur trade companies had hunted them almost to the point of extinction (Ridington, 1968:18). The woodland caribou (*Rangifer caribou sylvestris*) is also no longer found in the area.

In addition to the aforementioned mammals, the Peace River country hosts considerable avifauna. The study area

lies in the path of a major migration route, the Pacific Flyway; and contains staging areas of both ducks and geese. Of the game birds, the spruce grouse (Canachites canadensis) and the sharp-tailed grouse (Pedioecetes phasianellus) are indigenous to this area. Finally, the largest "summer grounds" of the trumpeter swan (Olor buccinator) are located immediately south of the Saddle Hills (Atlas of Alberta, 1969).

To the contemporary sports fisherman the Peace River country may be somewhat of a barren ground. However, persons in search of an additional food source might tap the lakes and streams for the following (Paetz and Nelson, 1970):

dolly varden	(Salvelinus malma)
goldeye	(Hiodon alosoides)
walleye	(Stizostedion vitreum)
mountain whitefish	(Prosopium williamsoni)
northern pike	(Esox lucius)
Arctic grayling	(Thymallus arcticus)
trout-perch	(Percopsis omiscomaycus)
burbot	(Lota lota)
yellow perch	(Perca flavescens)
brook stickleback	(Culaea inconstans)
sucker	(Catostomus sp.)
sculpin	(Cottus sp.)
minnow	(Cyprinus sp.)

CHAPTER III

ETHNOHISTORY

Two tribal names, the Beaver and the Sekani, have been applied to Indians who occupied the Peace River country in historic times. Jenness (1937) suggests that this distinction was the result of the influences of the fur trade; of the westward displacement of indigenous groups by the Cree who had associated themselves with the fur trading companies.

> It seems fairly certain . . . that not many centuries ago the Sekani and Beaver were one people divided into many bands which differed but little in language and customs. Their territory stretched from lake Athabaska west to the Rocky mountains . . . (Jenness, 1937:6-7).

This distinction was first made by Sir Alexander Mackenzie on his way up the Peace River to the Pacific Ocean. An entry in his diary while at Fort Fork, six miles above the juncture of the Smoky and Peace River, reads:

> Among the people who were now here, there were two Rocky Mountain Indians, who declared, that the people to whom we had given that denomination, are by no means entitled to it, and that their country has ever been in the vicinity of our present situation. They said, in support of their assertion, that these people were entirely ignorant of those parts which are adjacent to the mountain, as well as the navigation of the river; that the Beaver Indians had greatly encroached upon them, to retire to the foot of these mountains (Mackenzie, from Lamb, W. K. [ed.], 1970:249-250).

This distinction on the bases of alliances rather than cultural differences was recorded by Daniel Harmon:

> When Harmon first visited this country there were only four trading posts west of the fort, near the junction of the Smoky and Peace Rivers, viz., at Dunvegan, St. John, Hudson Hope, and McLeod lake. The Indians from the Smoky to Hudson Hope were rapidly adopting Cree culture in the same way as their kinsmen around Fort Vermilion; moreover, they were uniting with the Cree in attacking the Indians farther up the river. The bands west and south of Hudson Hope were alike in two respects: they were all at enmity with the Indians farther down the river and were all strongly influenced by the Carrier, so that they looked westward for their trade rather than eastward.
>
> Harmon, therefore, had some justification for dividing them into two tribes. His predecessors had applied the term Beaver to all the eastern bands, and the name Sicaunie which he gave to the western division was merely an extension, unconscious perhaps, of the name of the band that claimed the country around Fort McLeod to all the bands that hunted west of the Rockies. His classification has prevailed in all the later literature, although even today it is impossible to draw a sharp line between Sekani and Beaver Indians . . . (Jenness, 1937:8).

For the purpose of this study I will include the pertinent ethnographic data available on both "tribes" under the name Beaver Indians, following Ridington's (1968) use of that term. Together the ethnographic and archeological data will yield a more complete picture of the specific complex of adaptations to the physical environment necessary to the Beaver Indian life style in this area of northern Alberta.

The Beaver Indians had no sense of tribal unity. Rather, they were divided into independent bands of closely related families who derived their living by hunting and gathering over traditionally defined areas (Jenness, 1967:384). They had no regular chiefs.

> In fact, their society, such as it is, might almost be termed a perfect anarchy, were it not that the advice of the oldest or most infuential of each band is generally followed as far at least as regards hunting, travelling, and camping (Morice, 1894:28).

Historically, the Beaver have subsisted primarily on the moose, beaver, rabbit and other game animals. Because these are not herd animals, the bands had to be constantly on the move so as not to "hunt out" any portion of their territory. This almost constant mobility necessitated several specific adaptations which are discussed in the following paragraphs concerning particular natural resources utilized by the Beaver Indians.

Natural resources may be divided into two broad categories: 1) food resources; and 2) production resources. Included in the latter category are those materials used in providing shelter, transportation, clothing, tools, and weapons for a given population.

Food Resources

Each of the following animals inhabit some portion of Beaver Indian territory and were used as food (Morice, 1889, 1894):

moose	beaver
elk	marmot
deer	ground-hog
mountain sheep	rabbit
mountain goat	porcupine
black bear	squirrel
lynx	

Since the extinction of the bison and woodland caribou from their territory circa 1830 (Ridington, 1968: 18) the Beaver Indians have relied principally on the moose to fulfill their food requirements. Ridington (1968) suggests that this reliance upon a single major food resource results in a number of "ecological imperatives" which affect the density and distribution of the human population.

When the hunter fails in this particular environment there is not always available a " . . . less desirable stand-by" (Ibid.:21). Vegetable foods, such as service berries, edible roots and tubers, are not available in winter; nor are fish available in quantities sufficient to satisfy those needs otherwise fulfilled by meat.

> There are few small lakes where fish can be netted through the ice and the rivers can be fished with lines and gigs through the ice, but fish are at best emergency rations, not a permanent winter resource (Ibid.: 19-20).

The reports of earlier ethnographers are confirmed by Ridington's recent observations. Goddard (1916:216) states:

> When game failed, bands of Indians went together to fish lakes which according to the stories, were also visited by their enemies, the Cree. These lakes abound south and east of Peace River. There are also many lakes and sloughs in the country north and west of Peace River but not many of them have edible fish.

Jenness (1967:379) concurs:

> . . . they hunted in winter and summer alike, and resorted to fish only when driven by sheer necessity. Then they used nets of willow bark or nettle-fibres, fishhooks of bone set in a wooden shank, and tridents . . .

Whitefish and trout were the principal types of fish taken from the lakes in Beaver territory. They were taken in nets, seines, traps, weirs, and by hook and line (Jenness, 1937).

Because small game animals, particularly the rabbit are subject to population cycles, they do not always provide an adequate subsitute for big game. Ridington (1968:21-22) employs Liebig's law of the minimum to conclude:

> The minimum factors that appear to limit Beaver Indian population are the resources available during the most difficult winters at the bottom of the small game cycle. I suggest that it is not so much the absolute number of big game animals that limits Beaver population as the uncertainty of making a kill during the most difficult season.

The moose is a non-herding, very mobile animal and is most successfully hunted in the summer and during the fall rutting season.

> In summer and fall when people have accumulated supplies of drymeat and can gather vegetable foods the Beavers congregate to gamble using the drymeat as stakes. Larger associations of people for ceremonial and social activities are possible during the times when resources are easily available and reserves can be accumulated. The people who come together in the summer and fall are likely to consider themselves a single wutdunne or people but the wutdunne is not a permanently viable corporate economic unit (Ibid.:32-33).

In the following quotation Ridington (1968:39-41) discusses the effects of a moose hunting-based economy on population distribution.

> A hundred people cannot afford to move to the place where a single moose has been killed nor is the meat likely to be packed in from more than about 10 miles away. I make this assumption on the basis of present day practice. When meat is packed in (on people's backs)

from any distance, distribution usually takes place at the kill site rather than at camp. If the meat that a single person can carry were distributed among a group of 100 people the bearer would retain less than enough to feed himself let alone provide for his family. It is not worth one's while to carry 100 lb. of meat for 10 miles to get 1 lb. to consume in camp. When the decreasing availability of moose creates a situation in which some men return from a kill with meat to feed their families while others look on in hunger there are strong incentives to break up into smaller groups. The extent to which generalized reciprocity can be applied to co-resident band members is a function of the availability of resources and when sharing within a group becomes ecologically disadvantageous, the group will almost certainly segment.

Thus, when kills are being made at any distance from a large camp, generalized reciprocity, the distribution of meat to all co-residents, becomes ineffective. There is little advantage in remaining with a large camp if one does not receive meat from the other members. As soon as the kills are being made some distance from the camp and the meat is distributed to the bearers at the kill site rather than to all camp members, there are strong incentives for segmentation into smaller bands that can take advantage of mobility. Large bands remain together only when the game is relatively abundant and close to camp but must split into smaller distributive centers when game is scarce and far away.

A small group can afford to move for several days to a kill since it can stay at the site for several weeks. Thus, the hunters from a small group can effectively cover a much wider territory and so reduce their vulnerability to chance . . .

The strategic advantages of a group of 10 people are matched by certain disadvantages. Ten people will probably have only one or two effective hunters, and thus another form of chance comes into play. The group has no insurance against accident or illness of the chief hunter or hunters. If the hunters have to spend several nights away from camp (and this is common according to the stories), there is no-one to protect the women and children from animals, human or supernatural enemies.

Ridington (1968:41-42) concludes:

> I estimate that a group of between 20 and 30 is the optimum size to minimize the dangers of bad luck. Thirty people can subsist for a week on one moose and so maintain the flexibility of being able to move camp to kill site . . . A group of thirty would have at least five effective hunters . . . and probably more, so that some men could stay in camp while others went out hunting. There would be enough to use drives and co-operative techniques if they should seem expedient and there would be enough that the loss of one or two would not be a catastrophe for the whole group.

Prior to 1830 the Beavers had access to an additional resource, the bison.

> I can only speculate that in pre-contact times, the presence of two major big game animals, bison and moose, allowed for greater flexibility in group size and composition. The Beavers were then in the favorable position of occupying an ecological border zone that gave them access to a more varied resource base (Ridington, 1968:18).

The ethnographic reports on the Beaver Indians contain very few indirect references to the buffalo. I suggest this is because the buffalo were very early reduced in numbers to the extent that they were no longer remembered as a reliable resource at the time these descriptions were written. It is hard to believe as Jenness (1967:383) suggests that the Beaver did not fully utilize so complete a resource as the buffalo:

> Moose, caribou, beaver, and other game abounded and there were numerous buffalo which the Indians drove into pounds after the manner of the plains' tribes. Yet they esteemed the buffalo less highly than the moose, which gave them not only meat, but skins for clothing and for the cover of their tents.

Goddard (1916:214) also refers to communal buffalo

hunting amongst the Beaver:

> The buffalo seem to have been hunted solely on a community basis. The story of Agait'osdunne indicates very grave penalties for anyone who interfered with the community rights. The usual method was that of driving the animals into a pound.

The only reference to traditional Beaver method of hunting birds was written by Jenness (1937:39):

> By constructing long fences of brush, and setting snares at intervals of a few feet or yards, the Indians captured whole flocks of grouse, and whole herds of caribou . . .

Each of the following wild fruits and plants are found in Beaver territory and were used as food (Morice, 1894:125-132):

Saskatoon	(Amelanchier alnifolia)
blueberry	(Vaccinium sp.)
cranberry	(Viburnum sp.)
soapberry	(Sherherdia canadensis)
kinnikinik	(Arctostaphylos uva-ursi)
raspberry	(Rubus strigosus)
strawberry	(Fragaria sp.)
currant	(Ribes sp.)
red lily	(Lilium columbianum)
sweet flag	(Acorus calamus)
wild onion	(Allium cernuum)
dog tooth violet	(Erythronium giganteum)
cow-parsnip	(Heracleum lanatum)
willow herb	(Epilobium angustifolium)
shrub pine	(Pinus contorta)

Parts of these and other plants are used as well for medicinal purposes. Among the available wild fruits, saskatoons are of the greatest economic importance.

> Conspicuous among them, either by its abundance or its property of long keeping, and its consequent value as an addition to the native store of winter supplies is the service-berry (Amelanchier alnifolia) (Morice, 1889:133).

Raspberries, strawberries and currants are eaten fresh. The others are either eaten fresh or preserved for later use first by boiling, kneading them to extract the juice, and finally drying them. These resources, particularly blueberries, are sensitive to weather conditions and are subject to crop failure over large areas. The distribution of this important dietary supplement must have affected the seasonal round of the inhabitants of this region.

Production Resources

Shelter. The primary shelter of the Beaver Indians was the tipi. The foundation of the tipi consisted of three or four poles which interlocked at the top. This was overlain by several additional poles and a covering of either moose or caribou skins tailored to leave considerable opening at the top (Goddard, 1916:210).

> It seems queer that no mention is made of the use of buffalo skins, which were ordinarily used for this purpose in the Plains, since the animals were plentiful in parts of the Beaver territory (ibid.:210).

When the band moved, only the skin covering of the tipi was retained.

> Suitable poles are easily secured in the north and are not ordinarily moved from place to place but are left standing (Ibid.:210)

Goddard (1916:212) describes the other types of shelter built by the Beaver Indians:

> Temporary camps in summer are made by throwing together trees with the leaves on them so that they rest upon a tripod foundation. Trappers and other travellers overtaken in winter away from tipis build windbreakers of brush which in addition to keeping off the wind reflect back the heat of the fire.

Transportation. In an area such as the Peace River country, where food resources are scattered and the population sparse, transportation is very important.

> For property this is in a large measure avoided by means of caches. Each family, or larger band, visits the same localities at different seasons each year. In spring the property pertaining to life in winter is stored out of the reach of animals, usually in thick timber, but sometimes on a platform supported by four or more posts. The customs of the country are such that only the most shameless of men will take anyting from such a cache (Goddard, 1916:212).

The use of caches for stone tools will be discussed in a subsequent section of this paper.

All items necessary to daily life however, had to be carried with them.

> Food and small objects are stored and transported in large square bags made of skin with the hair left on. These are often made of the legskins of the caribou pieced together, or of the headskins of the moose (Ibid.: 213).

The Beaver also made containers of spruce or birch bark, woven spruce roots, and babiche (Morice, 1894).

In winter, snowshoes facilitated travel through the deep snow (Morice, 1894:151). There are conflicting theories

concerning the antiquity of the use of toboggans amongst the Beaver. Jenness (1937:42) suggests that the toboggans is a recent acquisition and that these people formerly ". . . carried all their possessions on their backs during the winter months". All observers agree that dog traction is recent. Ridington (1968:20) offers the following ecological explanation:

> The most obvious effect of the poverty of fisheries is seen in the domestic dog population. Men and dogs are direct competitors for the same part of the food chain. In the North, only people who have good winter supplies of frozen fish can afford to keep many dogs. Throughout most of northeastern Canada the fish-dog ratio is good enough to make dog teams the usual means of winter transportation. The early fur traders noted with surprise that among the Beavers, women rather than dogs were the beasts of burden.

In summer transportation was an easier matter. In addition to packing goods overland the Beaver Indians travelled the river courses in canoes of sprucebark or birchbark.

Clothing. Clothing was made from the hides of the animals they hunted, primarily the moose, caribou, rabbit, and groundhog. Beaver Indian articles of clothing included: robes (of various types), leggings, breechcloths, belts, moccasins, caps, and mittens. The hides were tanned with the hair left on for winter garments and with the hair removed for summer clothing (Goddard, 1916). Articles of personal adornment were made from a variety of materials including bone, antler, shell and wood (Morice, 1894).

Tools and Weapons. The tools and weapons of the Beaver Indians were made of stone, wood, antler, horn, bone, and teeth. For information concerning all but the former we must rely on the information gathered by early ethnographers. Morice (1894:52) emphasizes the importance and variety of tools made of materials other than stone:

> The most serviceable and therefore highly priced working or carving knives in use among the prehistoric Denes were nothing more or less than beaver teeth sharpened when necessary by friction on a hard stone.

Other implements of wood, antler, horn, bone, and teeth described by Morice (1894) include: barbed harpoons, fish hooks, awls, scrapers, wedges, picks, spoons, combs, mauls, and gaming pieces.

These materials figured as well in Beaver Indian weaponry:

> The 'cut-arrow' was so called on account of its peculiar shape. Its point was made of a caribou horn and was awl-like in form. Its broader extremity was hollowed out to receive a wooden shaft which served to dart it off from the bow as a common arrow, with this difference however that, when in motion, the horn point detached itself from the shaft. This projectile was deadly, and intended only for use against a human enemy or for killing large game.
>
> To shoot smaller game they had recourse either to the triple headed arrow . . . or to a wooden blunt arrow. The former consisted of three flat pieces of bone, or more generally horn, cut transversely at their broadest extremity and fastened to the shaft through their smaller end and sides by strong sinew-threads. It did good service even against larger animals, and it is not more than 40 years since it has entirely fallen into disuse (Morice, 1894:56-57).

Morice (1894) mentions the following stone tools formerly in use amongst the Beaver Indians: axes, adzes,

wedges, scrapers, hammers, knives, projectile points, and bow points. In the following quotation Morice (1894:50-51) describes the steps followed in making from a pebble, by the bipolar technique, a scraper of the sort used in processing hides:

> Most of these tools have received very little artificial treatment in their manufacture. In fact, they are almost invariably made as follows: any flat pebble which is likely to split as desired and thus yield easily suitable material for the intended scraper is secured up between two stones on the ground and then split asunder by vigorously throwing a large stone on its upper end. The half which best answers the purpose in view is then trimmed to the proper shape by chipping off any too prominent asperities, or blunting the edges, should these prove too sharp.
>
> The scraper is finally hafted . . . by inserting it in the cleft end of any stick at hand over which a rope or buck line is securely lashed. This hafting is but temporary, as the stone part only of the implement is usually kept among the family chattles.

Abundant evidence of the use of this technique was found at the Ski Hill site (GiQq 301) and will be discussed in a subsequent section of this paper. Morice (Ibid.:65) further describes the manufacture of projectile points and acknowledges the existence of quarry sites.

> The material chosen in preference to fashion arrow or spear heads with was loose, broken pieces of rock such as were found on the surface. Of course these were confined to a few localities only, wherein were situated sorts of quarries which were very jealously guarded against any person, even of the same tribe, whose right to a share in their contents was not fully established. A violation of this traditional law was often considered casus belli between the co-clansmen of the trespasser and those of the proprietors of the quarry.
>
> The first operation consisted in roughly blocking off with a hard stone the pieces of the flint, the removal of which was necessary to obtain a vague resemblance to the intended weapon. Then grasping the flint lengthwise with

> the closed fingers of the left hand, the arrow-smith carefully pressed off the flakes with an elongated stone held in his right hand until the desired form and finish were obtained. A piece of buckskin served as a pad to protect the hand against the asperities of the point.
>
> I owe these details to an old chief who has been an eye-witness to the operation. I should add that in not a few cases a moose molar tooth replaced the long chipping stone. I know also of a very few points the sharp edges of which have been polished off by friction.

Finally, Morice (1894:60-61) describes a third use for the stone point, not as a projectile but as a bow point:

> It was brought into requisition by the warrior or the hunter when too closely pressed by the enemy to shoot, and was used as a spear. Such points were of identical material with that of arrow-heads . . . These weapons were inserted in a slit at one end of the bow and securely fastened therein with pitch inside and pitch and sinew outside.

These are the items of material culture which most commonly constitute the archeological record of these people and their predecessors. All ethnographers emphasize the importance to the Beaver of a variety of snares, traps, nets, and deadfalls in procuring game of all sorts. For example, Jenness (1967:379) states:

> . . . their weapons procured them less game than their snares of babiche, which they used for every animal from the marmot to the moose.

Of these we have no record other than the ethnographic reports. It is possible that the success of this complementary method of hunting prior to the influence of the fur trade had some undetermined effects upon other aspects of Beaver Indian culture.

CHAPTER IV

ARCHEOLOGY

Saddle Hills Archeology Survey

A survey of the Saddle Hills was first suggested to me by Dr. A. L. Bryan of the University of Alberta. Bryan had, on a previous trip, located two sites in that area and had recorded several private collections in the Peace River country, notably those of Mr. Eric Anderson of Wembly and Mr. Wallace Tansem of Wanham.

My intention in undertaking the project was to establish the archeological potential of the area by conducting a systematic survey of the Saddle Hills and surrounding district.

The survey was inhibited by two factors, vegetative cover and limited access. The main body of the hills is covered by virgin forest which affords very few opportunities for finding evidence of prehistoric occupation. In addition, many of the cut lines and seismic trails into the hills were impassable until very near the end of our stay.

Consequently we restricted our efforts to the slopes of the hills where farming activities, road cuts and other exposures afforded us the opportunity of finding sites. To a considerable extent then, the distribution of known archeological sites (Fig. 2, p. 101) is a function of accessibility

rather than an accurate reflection of the pattern of occupation by prehistoric inhabitants. For example, we found many more sites along the south slope of the hills than we did along the north slope. Although the south slope may have offered a more favourable environment to prehistoric inhabitants, we cannot assume that this pattern will survive a more representative survey. Farming activities have penetrated the hills to a greater extent along the south slope; the north slope is still forest covered and therefore relatively inaccessible to archeological survey.

The distribution of lithic materials, however, has affected the nature of archeological sites within the study area. As was noted earlier (p. 8, this paper), considerable quartzite is distributed over the surface of the Saddle Hills. The most substantial concentrations occur discontinuously along the brink of the hills. Archeological sites located in these areas typically yield large numbers of artifacts of all sizes. Conspicuous among them are the large numbers of cores and cobble tools. Sites of similar character are known in other upland areas of the Peace River country such as the Birch Hills, Blueberry Mountain (Dr. A. L. Bryan, per. comm., 1970), and Saskatoon Provincial Park (Mr. E. Anderson, per. comm., 1970).

The surrounding lowlands, in contrast to the hills, are virtually stone free, except along the infrequent stream courses. The camp sites we located on the survey below

approximately 2500 feet ASL exhibited only sparse cultural materials deficient of large cores and core tools. The greatest proportion of those materials are of chert. The occoupants of these sites must have carried the stone they required with them from quarries such as the Ski Hill site or from caches. Moreover, the data suggest that under these circumstances Indians chose to carry chert rather than quartzite probably because of its superior flaking properties.

During the summer of 1969, two caches were uncovered by farm implements. One of these, found near a shallow lake one half mile south of Wembley, contained bipolarly split chert pebbles and fragments. The largest specimen recovered is about the size of a man's fist. The second cache found four miles northeast of La Glace, contained 29 large, finely flaked quartzite bifaces.

In 1968, Dr. A. L. Bryan salvaged a portion of the Karpinsky site (GkQn 100), also located on the lowland at the base of the Birch Hills, near Wanham, Alberta. All of the artifacts recovered from the site were found in an area roughly fifty feet in diameter. Less than ten percent of these materials are of quartzite, the remainder are of chert; detritus constitutes a significant proportion of the flaked stone material recovered. The location of the site, its restricted areal extent, and the high proportion of detritus suggest that this may have been a cache to which the owners returned and made the tools they required.

Since the completion of my research in the Saddle Hills I have had an opportunity to conduct an archeological survey in the eastern half of the Peace River country, including the Lesser Slave Lake area. The results of this survey confirm the pattern of distribution of quartzite and the preferential use of chert at lowland sites found in the study area. Unfortunately, the character of these sites renders them difficult to find and their location on preferred farmland mitigates against finding one which has not been thoroughly distributed by the plough.

The source(s) of the chert, ubiquitous at sites in the Peace River country, is as yet problematical. The following factors reflect something of the nature and location of the source: (1) chert is found at every site located on the Saddle Hills and Slave Lake surveys and in every private collection known to the present author; (2) chert has been used to make virtually all of the point forms known from this region; (3) chert was the preferred material for some classes of tools where quartzite was readily available; (4) to my knowledge chert is not generally distributed in the glacial deposits of this region and (5) chert has been found in pebble form in caches.

These factors suggest the following: (1) Prehistoric peoples had access to chert either through trade or from a quarry; (2) That chert had to be transported, at least in some areas, is indicated by the fact that it occurs in caches

and that individual pieces are not larger than a man's fist; (3) The fact that it is found on all known sites in the Peace River country in some form or other indicates that it was readily obtained, at least in small quantities.

To my knowledge only two sources are known in northern Alberta and British Columbia. Dr. T. Habgood (per. comm., 1970) located an outcrop of this material in the drainage system of the Liard River, northeastern British Columbia. I consider this source too distant to have been important to prehistoric inhabitants of the Peace River country. The second source was located by Father van der Steen (per. comm., 1972) on the Red River approximately one mile above its junction with the Peace River near Fort Vermillion. Here cobbles are weathering out of a limestone exposure in the river valley. Father van der Steen collected "a few artifacts" from this locality.

The Red River locality seems to be a more likely source of chert for the prehistoric inhabitants of the study area. Although I have not visited the site, it does not seem likely that this locality would have been a source of sufficient quantity to satisfy the needs of the population of the entire Peace River country at any one time. I suggest then that this may be only one source and that others will be located.

Artifacts of two more exotic materials, obsidian and jade, have been found in the Peace River country. Of the

two, obsidian is more generally distributed in the study area. The specimens that I have seen and collected all indicate that considerable economy was exercised in the use of this material. I have seen only two artifacts of jade that were found in the Peace River country. The source of both of these materials most likely lies west of the study area.

All localities in the Saddle Hills area where we found evidence of prehistoric occupation are plotted on Fig. 2, p. 101. Of these we tested eight, chosen on the bases of: (1) the availability of an undisturbed portion of the site; (2) the possibility of stratification; and (3) the nature and quantity of exposed artifacts. Following the test excavations only the Ski Hill site (GiQq 301) continued to satisfy these criteria.

The Ski Hill Site (GiQq 301)

Throughout the survey site numbers were assigned on the basis of the apparent surface distribution of cultural materials. In some portions of the Saddle Hills, notably the area presently under discussion, this practice misrepresents the field data and therefore, requires qualification.

Initial reconnaissance in the vicinity of the Ski Hill revealed that cultural materials are found discontinuously over an area of at least two square miles. The Borden number GiQq 301 and the name Ski Hill site were applied to that apparently isolated surface manifestation contained in

the south half of section 9, township 74, range 5, west of the sixth meridian. Subsequent test evacuations indicated however, that the subsurface distribution is not discontinuous; that the area of occupation is, as yet, of undetermined extent.

GiQq 301 was first discovered in the ploughed field (Fig. 2, p.101) at the top of a rope tow used by the Sexsmith Ski Club. Three advantages afforded by this particular locality to prehistoric inhabitants were immediately obvious: (1) the availability of abundant raw materials in the form of quartzite pebbles and cobbles; (2) the site lies in the narrow ecotone between the parkland and the mixed wood forest and provides a vantage point from which to scan the prairies to the south; (3) water is available on the site from a natural depression which although it is seasonally dry now, may have been deeper in the past.

The advantages of this site to the archeologist over others found on the survey were also obvious: (1) the ploughed field contained the greatest concentration and variety of cultural materials of any site found on that survey; (2) some portion of the site adjacent to the ploughed field had not been disturbed; (3) the site was unknown to collectors prior to our arrival.

Having obtained permission from the landowners, Mr. Frank Plahta of Sexsmith and Mr. Conrad Wrzosek of Beaverlodge, we undertook test excavation of the site. In 1969 a

single two meter test pit was excavated in the pasture very near the fence. The following season we expanded that pit into a trench of five units (Test Trench 1, Fig. 3, p.102).

Stratigraphy. In order to understand the relationship between the natural stratigraphy and the vertical distribution of cultural materials at the site, we excavated the original test pit below the deepest occurence of cultural materials, to a depth of four and one half feet. We sunk an auger hole an additional four feet into the floor of that unit. From the north wall we recovered a soil column which was preserved and brought back to Edmonton for further analysis and description.

The natural stratigraphy of the original test pit typified that found in all subsequent excavation units and conforms to the description of the "Saddle Series" of soils (Odynsky, et al.:41-42).

The A horizon of the soil column is composed of: one inch of dark brown to black leaf litter (A_o); five inches of dark brown to grey brown loam (A_1); four inches of yellowish brown sandy loam (A_2).

The B horizon of the soil column is composed of: three inches of yellowish clay loam which bears the form of the tops of old columns (B_1); eight inches of yellowish brown clay loam to clay, weakly columnar, blocky, firm (B_2); twelve inches of dark yellowish brown to brown clay loam, blocky, friable (B_3); a very thin calcium deposit is visible at 33

inches below the surface (B_{ca}). The parent material or C horizon is greyish brown, clay loam till.

The only strata discernible at the Ski Hill site are the aforementioned A, B, and C horizons characteristic of the Degraded Black (Solodic) soil predominant in the area. Contained within the A horizon however, are several, very thin charcoal lines. These lines, records of one or more fires, are too discontinuous and often too ill-defined to afford reliable markers of cultural succession. Cultural materials, with the exception of a single feature, are not disbributed below the top surface of the B horizon.

Test Trench 1. The original test pit (AA2), the middle unit of Test Trench 1, is the only excavation unit from which we recovered cultural materials below the top of the B horizon. A former depression is indicated on the profile of the west half of the north wall of AA2 by a 'paleosol' which extends downward from the bottom of the A horizon to a depth of 40 centimeters below the surface. The northwest quarter of AA2 covers virtually all of this depression or pit.

From the bottom of the depression (35 to 40 centimeters below the surface) in an area 20 centimeters in diameter we recovered 98 flakes of which 48 are chert (ten are fragments of bipolarly split pebbles) and 50 are quartsite. The latter are divisible into groups of 5, 5, 7, 2, 2, 2, 4, and 14 flakes representing eight different nodules,

and 9 apparently isolated flakes. Also found in this concentration was one fist-sized bipolarly struck, quartzite pebble.

Above the concentration, throughout the rest of the pit we found: 28 quartzite flakes, five of which are from the same nodules as some of those in the concentration; both halves and three fragments of one bipolarly split, fine grained quartzite cobble; four pieces of quartz all of which fit together; three unifacially retouched scrapers; one bipolarly chert pebble core; one biface; one biface fragment; and one complete projectile point. It was not clear whether particular items were located in the A horizon or in the 'paleosol' as the latter only became distinguishable after it was exposed on the profile.

Two factors indicate that at least some of the lithics from AA2 formed part of a small cache: (1) the materials found below the top of the B horizon in the northwest quarter of AA2 were concentrated in a very small area; (2) the concentration was found at the bottom of a depression or pit, the surface of which was outlined on the profile of the excavation unit. The form of these materials, being mostly flakes; and the distribution, the fact that flakes from the same nodules as some of those found in the concentration were found either on the slope of the depression or in the bottom portion of the A horizon, indicates that these materials were worked or reworked at the cache.

Whenever it is obvious I will indicate in the text of this paper those groups of flakes which appear to be from a single nodule of rock. It is possible to do this with a considerable degree of certainty with quartzite because of the wide range of colors and textures found in this material. The variations in chert however, are much more subtle and not necessarily distinguishable with the naked eye. For this reason I have not attempted to identify groups of chert flakes which may be from the same nodule.

It was my intention in excavating Test Trench 1 to determine whether or not the differential vertical distribution of cultural materials extended beyond the feature found in AA2. During that excavation I did not ask that the horizontal distribution of the debitage be recorded on planviews.

The materials recovered from each unit of TT1 (listed from north to south omitting AA2) are:

1. A2 - 1 chert biface fragment
   - 1 quartzite biface fragment
   - 1 quartzite projectile point fragment
   - 1 pièce esquilleé (chert)
   - 53 quartzite flakes (divisible into groups of 6, 6, 8, 2, 3; 3 are decortication flakes)
   - 22 chert flakes
2. B2 - 1 projectile point fragment
   - 1 spall scraper
   - 33 chert flakes (including 1 decortication flake)

- 73 quartzite flakes (including 36 apparently isolated flakes; the remainder are divisible into groups of 8, 2, 2, 3, 2, 3, 7, 2, 2, 4, 2; of the total number only two are decortication flakes)

3. BB2 - 1 complete projectile point

- 2 chert end scrapers

- 1 bipolar core

- 2 quartzite cores

- 5 chert flakes

- 16 quartzite flakes (of the flakes 4 are decortication flakes; 1 is from the same rock as some of those in the AA2 concentration)

4. CC2 - 1 core

- 1 core tool

- 1 large flake tool

- 25 quartzite flakes (the flakes are divisible into two groups of 3 and 2, the remainder are isolated; 2 are decortication flakes)

One additional unit, Test Pit 3, was excavated using the same technique four meters east of TT1:

TP3 - 1 chert biface fragment

- 1 quartzite scraper

- 11 quartzite flakes (one group of 2 only)

- 3 chert flakes (one is a decortication flake)

Having achieved these results from TT1, I realized that the only hope of identifying an assemblage at this site lay in paying particular attention to the spatial relationships of all artifactual materials. Subsequently, we excavated nine test pits over an area of one half square

mile in the hopes of discovering another undisturbed activity area.

Although cultural materials were recovered from each of these units, the most significant results were obtained from the test pit forming the southwest corner of Excavation Area 1 (Fig. 5, p.104). In the northeast quarter of that unit there was a concentration of 22 chert flakes and split pebbles which, although not recorded in Fig. 5 (p.104), was observed during excavation. We expanded our excavations there to the limits of the natural clearing, exposing and plotting every artifact and piece of fire-cracked rock found.

Excavation Area 1. On completion of this excavation we had exposed a workshop activity area; a hearth encircled by six definite concentrations of flakes. In addition, throughout the excavation area a variety of stone tools was found, many of which were probably used in the manufacture of other tools, (Fig. 5, p.104). The description and analysis of each of the features found in Excavation Area 1 follows.

Feature 1:

The hearth exposed in EA 1 was circular. The fire was contained in a central depression in the hearth, the bottom of which was lined with rock (re: photo insert and cross section, Fig. 5, p. 104). That the last fire was put out, in part, by destroying the hearth is

suggested by: (1) a break in the circumference of the hearth, and (2) a dark stain extending continuously from the break to (3) an isolated cluster of fire-cracked rocks 40 cm. southwest of the actual hearth. The hearth was intact save for this one break.

From within the hearth we recovered 44 flakes, 37 of which are from the same white, fine-grained quartzite nodule. Of the 37 flakes, three are decortication flakes and seven are biface trimming flakes. The platforms of 4 of the latter have been ground. We also found a pebble-sized anvilstone and a projectile point fragment in the hearth.

Feature 2:

Of this cluster of 23 flakes, 14 are from the same rock as the group of 37 flakes in Feature 1. Of the 14, two are biface trimming flakes, both of which have ground platforms. There are no decortication flakes in this group.

Feature 3:

Of this cluster of 13 flakes, ten are from the same rock as those groups of 37 and 14 in Features 1 and 2. Three of these are biface trimming flakes, two of which have heavily ground platforms. There are no decortication flakes in this group.

Feature 4:

Of this cluster of 62 flakes, 40 are from a single nodule. Four of these are biface trimming flakes; three of which have ground platforms. There are no decortication

flakes in the group of 40 flakes.

Feature 5:

Of this cluster of 19 flakes, 16 are from a single nodule. Five of these are decortication flakes; six are biface trimming flakes. Four of the latter have ground platforms.

Feature 6:

From within the northeast quarter of the original test pit in this area we recovered 22 chert flakes. Five additional chert flakes were recovered from the north baulk of this pit. Together these 27 chert flakes constitute Feature 6. Three of these pieces retain enough of the form of the original nodule to suggest that the occupants of this portion of the site were actively searching out and bipolarly splitting small chert pebbles.

In addition to the above, flakes from the same rock as the majority of those in Features 1, 2, and 3 were found scattered in the following units: D2, 35 flakes; C2, six flakes; C3, three flakes; B3, one flake. A total of 106 flakes from the same nodule were recovered in situ. Seven of these are decortication flakes and 23 are biface trimming flakes. Fifteen of the latter category have ground platforms.

Eight flakes from the same nodule as the majority of those in Feature 4 were found in unit C2. A total of 48 flakes from this nodule were recovered. None of these are decortication flakes; five are bifacial trimming flakes. Of

the latter, four have ground platforms.

One flake from the same nodule as the majority of flakes in Feature 5 was found in unit C3. A total of 17 flakes from this nodule were recovered. Five of these are decortication flakes; six are bifacial trimming flakes. Of the latter, four have ground platforms.

Summary and Interpretation

We were unable to excavate the entire area surrounding the hearth because of the limited size of the natural clearing. Nevertheless, on the basis of detailed analysis of the relatively small artifact sample recovered, I propose the following tentative conclusions concerning the activities which took place around the hearth.

The distribution of cultural materials in Excavation Area 1 is the result of a single occupation, the living floor of which was not subsequently disturbed.

Bifaces were made around the hearth from at least three quartzite nodules. The distribution of flakes from one of these nodules (within the hearth and in Features 2 and 3) may be the result of the knapper changing position in order to accomodate particular motor habits.

We did not recover the tools made from those nodules which are represented by groups of flakes. Presumably they were manufactured in this area for use elsewhere.

Not all steps in the manufacture of these stone

tools were performed around the hearth. We found no decortication flakes of that nodule represented by the majority of flakes in Feature 4. In addition, there is a conspicuous lack of large quartzite cores and fragments so abundant in adjacent areas of the site. Some preparatory flaking, presumably involving the less subdued techniques used to reduce larger nodules to a more portable and approximate form, was accomplished elsewhere on the site.

Small pebbles were bipolarly split in this area. Eight pebble cores, two of quartzite and six of chert, were recovered. Two of the latter have the opposed, elongated straight platforms of pièce escailleés (wedges). The only hammerstone identified from this assemblage is relatively small (4.8 cm. long) and was probably suited to the task of splitting small pebbles. Three of the endscrapers found in Excavation Area 1 are made on bipolarly split chert pebbles possibly resulting from the activity represented by the aforementioned tools.

Only indirect evidence of work in media other than stone was found at the Ski Hill site. Two of three core tools, one awl-like chert implement, and three scrapers recovered from Excavation Area 1 exhibit the well rounded, polished edges indicative of use.

Complete Surface Collection

During the summers of 1969 and 1970 the present author and members of the field crew collected several

artifacts from the surface of the fallow field adjacent to our excavations. We observed that the cultural materials were concentrated roughly in the center of the field along the brink of the hill. Upon returning from the field at the end of August, 1970, Dr. David Lubell, University of Alberta, suggested that I attempt a controlled surface collection of a portion of this field. Acting upon his suggestion, I returned to the site for one weekend with one veteran crew member and eleven volunteer students. The aim of this project was to determine what activity areas, if any, one might define within that portion of the site which had been cultivated annually, in this case, for more than ten years.

Two factors favoured this experiment: (1) The site was apparently unknown to collectors prior to the initiation of the project. The only lithics that had been taken from the field were those we had collected and which remained in our possession; (2) The landowner, Mr. Frank Plahta, very kindly offered to cultivate the field prior to our arrival thereby affording us a fresh surface from which to make the collection.

The initial step in securing the sample involved placing a grid system on the field. We positioned the axis of the grid such that the area of collection was contained within one quadrat, quadrat 3. We then marked each axis off in five foot units, i.e., x = -1 being zero to five feet from the axis, x = -2 being five to ten feet from the axis,

and so on. Each five foot square could then be located by its x and y coordinates. For example, the square x = -15, y = -10 would be 70 to 75 feet along the x axis and 45 to 50 feet along the y axis. The intersection of four lines drawn from these points forms the five foot square x = -15, y = -10.

The smallest unit of collection was one square foot. To accomplish this we used six five foot square frames subdivided by strings into 25 units of one square foot. Each square foot was then given a number. As the individual faced the row he was collecting, the square foot in the lower right hand corner of the frame was number one.

The numbering proceeded from the right to left as it does with sections of land, the square foot in the upper left hand corner of the frame being number 25. Using this system the contents of any one bag could be located (replaced) to within a square foot of its location in the field.

The area we decided to collect was contained within the coordinates x = -20 to -40, y = -1 to -20, a total of 10,500 square feet. We laid the frames side by side along the x axis. Two people were assigned to each frame: one to collect and bag the rock from each square foot; the other to label each bag and put them in boxes. We then began simultaneously to collect all of the rock from each row; the first frame collected the rock from row x = -20, y = -1 to -20; the second frame collected the rock from row x = -21, y = -1 to -20, etc.

Because only one of the people participating in the collection had had any experience with lithic materials, it was necessary to collect all of the rock visible on the surface at the time each square was approached. Although this more than doubled the work load, the present author deemed it necessary in order that we make the most efficient use of the time available to us. In spite of this, however, misrepresentation of some forms of artifactual materials is unavoidable. Some of the factors governing this phenomenon will be discussed in subsequent paragraphs.

In three days, twelve people travelled 350 miles, collected approximately 16,000 pieces of rock, put them in 6500 paper bags , put those in turn into 112 boxes and made the return trip to Edmonton.

The cultural materials and the fire-cracked rock identified from this collection are plotted on an overlay (Fig. 6, p.105). Unfortunately I did not have the financial resources necessary to have this figure reproduced properly and as a consequence, some distortion is noticeable. However, as the distortion is in the reproduction it does not misrepresent the raw data.

For the four areas outlined on the overlay containing question marks, I have no data. The box(es) containing the rock from these units were lost, probably en route from the site. The fifth area, outlined on the bottom sheet only, is Test Trench 2. This trench was excavated (using a shovel

and screen) after the collection was made in an attempt to determine the extent to which the surface collection in fact represented the distribution of those materials beneath the surface. The data from Test Trench 2 are plotted in Fig. 9, (p.109).

The bottom sheet of the overlay depicts the distribution of fire-cracked rock in the collected area. One concentration of fire-cracked rock is apparent on this sheet. It is contained within the coordinates x = -27 to -28 and y = -11 to -14. Significantly, this concentration correlates with the highest density of cultural materials depicted on the top sheet of the overlay. I interpret these data as representing an activity area comparable to that found in Excavation Area 1: as a hearth area around which individuals were engaged in the manufacture of stone tools.

Outward from the hearth in every direction the distribution of fire-cracked rock lessens, particularly to the southwest where presumably the slope of the hill (Fig. 6 p.106) became prohibitive. Nevertheless, fire-cracked rock is scattered fairly evenly over the remainder of the collected area. This distribution is probably the result of repeated cultivation. It is impossible to determine whether the hearth was the only source of fire-cracked rock or whether some other cultural activity, for example, heat treating, contributed to the number of fire-cracked rocks recovered.

Figures 7 and 8 represent the distribution of rock

in the collected area by number and by weight. The "contours" were drawn on the basis of these measurements from 64% (279) of the five foot square units. These figures were applied to the center of each unit. Read together with the overlay these diagrams reveal some correlation between the size of the raw materials and the nature of the cultural activities which took place.

At this site, where the inhabitants were quarrying raw materials in the form of pebbles and cobbles, the areas containing the greatest concentration of cultural materials generally coincide with those areas containing the relatively larger rocks. This correlation is particularly strong as regards the distribution of cores. On the other hand, the nature of the activities which took place around the hearth, that is, the generally more subdued (and in terms of absolute numbers, more prolific) flaking, inferred from the findings in Excavation Area 1 and Test Trench 2, and the hearth itself, tend to reverse this correlation. The extent to which this reversal manifests itself is dependent upon the intensity and duration of these activities.

The materials recovered from Test Trench 2 reveal something of the disparity between what we recovered from the surface of the collection area and what lay beneath the surface. From TT 2 we collected 979 flakes and chips. From the surface of the trench we collected seven flakes, less than 1% of the total number of flakes found in that portion

of the site. Flakes and chips, particularly pressure flakes, are generally very small and numerous. This combined with the windy conditions in a freshly ploughed field during the days on which the collection was made probably contributed somewhat to this gross misrepresentation. It is likely then that a number of localized activity areas, i.e., clusters of related flakes (flakes from a single rock) are not represented on the overlay (Fig. 6, p.105).

Test Trench 2 is composed of seven units two and one half x five feet. Within each of these units a percentage of the total number of quartzite flakes recovered were determined to be from the same rock as other flakes of the same unit. The percentages are :

1) unit X = -22, Y = -13/ 30%;
2) unit X = -23, Y = -13/ 49%;
3) unit X = -24, Y = -13/ 51%;
4) unit X = -25, Y = -13/ 30%;
5) unit X = -26, Y = -13/ 32%;
6) unit X = -27, Y = -13/ 50%;
7) unit X = -28, Y = -13/ 48%.

Considering the small size of these units and the fact that this percentage does not take into consideration inter-unit relatedness, this percentage should be considered a minimum expression of the coherence of these materials. The high percentage of relatedness indicates that the spatial

relationships of the smaller items of cultural material have not been obliterated by ten years of cultivation.

The data from TT 2 (Fig. 9, p.110) support the hearth interpretation of the concentration of fire-cracked rock. The distribution of fire-cracked rock in the trench peaks immediately east of the concentration depicted on the overlay. The trough in units X = -26 to -27, Y = -13, indicates that more of the fire-cracked rock from this area was exposed on the surface and was, therefore, picked up in the collection. Burned bone and flaked stone reach their highest density within five feet of the overall concentration.

Test Trench 2 yielded 187 pieces of fire-cracked rock. Forty-nine pieces, or 20% of the total were collected from the surface. The more accurate representation of fire-cracked rock as opposed to flakes and chips, is a function of size. Apparently in this particular physiographic situation (it being an erosional surface), rocks over two to three inches in diameter, once exposed, are not generally reburied.

Features known to have been constructed by Indians in the Peace River country are subject to differential representation using this sampling technique. Features which by definition were cut into the living surface, and which might not be disturbed by the plough (for example, caches and boiling pits) are not represented in the controlled, complete surface collection.

Finally, the collected area represents less than half of the total area over which cultural materials are distributed in this part of the ploughed field. A second, apparently isolated area of concentration is located approximately 300 yards north in the same field. The significance of the surface distribution of cultural materials at this site is discussed in the concluding section of this paper.

Classification of the Lithic Materials from GiQq 301

Cultural materials from GiQq 301 are not separable into chronologically or spatially distinct assemblages. I have therefore disregarded the specific circumstances of their recovery in the following classification system that is, artifacts from Test Trench 1, Excavation Area 1, the controlled surface collection, etc., are not differentiated within this system. Although the available data precludes estimates of group size or chronological succession, analysis and classification does reveal something of the nature of the activities which took place at the site and of those patterns of utilization of the lithic resource.

I have suggested that the materials found on the site are primarily the result of quarrying and workshop activities. A variety of stone tools in various stages of manufacture were found at the site, both on the disturbed surface of the field and in the excavations.

It would be an impossible task to present here all

of the data gleaned from analysis of each of the specimens. I have generalized these data, hopefully not to the point of misrepresentation, in the following classification system, the categories of which were developed from the materials collected.

Cores. Conspicuous among the artifacts recovered from the site is the large number of cores.

For the purposes of this paper a core is any rock (nodule) with a minimum of three flakes removed, such that the apparent primary function was to provide flakes, which may or may not be further modified to suit the needs of the individual knapper.

The second part of this definition requires a subjective evaluation on the part of the archeologist; that is, an opinion concerning the positioning and size of the flake scars. These factors I have not attempted to quantify for this report; rather, my classification is based on my own observations and experiments with similar artifacts from several sites in northern Alberta.

I have subdivided the cores on the bases of platform preparation and positioning as follows (the number of cores of each type recovered from the site follows the description of that type):

I No Platform Preparation:

a) Single platform, bifacially flaked cores;
Flakes are struck from around the greatest circumference of the nodule. The presence of cortex on both sides of the core indicates that there was no preparatory bipolar splitting. 19

b) Single platform, unifacially flaked cores;
These cores are the same as the above with the exception that they are unifacially flaked. 20

c) Single platform cores, unifacially flaked to the ventral side;
Initially the nodule is bipolarly split. Flakes are then removed from one half of the rock by striking the cortex just above the split surface. 32
Flakes obtained in this manner have two particular characteristics: i) the bulbar end only is covered with cortex; and ii) the flat, split surface forms one side of the initial flakes.

d) Isolated flake cores;
Three or more flakes have been struck from the nodule along a single plane. The bulbs of each are separated by intact cortex. 7

e) Bipolarly struck cores;
The nodule was repeatedly struck along a single plane as it was turned on an anvil. 5

f) Bipolar cores;

The nodule was placed on an anvil and repeatedly struck on the same axis. 11

II Platform Preparation:

a) Unifacially flaked, prepared platform cores;
Initially a nodule is bipolarly split. Using the split surface as a platform, the dorsal (cortical) surface is unifacially flaked. 14
Flakes obtained in this manner have two particular characteristics: i) cortex covers one surface of the initial flakes; and ii) the profile of the flake, if it does not hinge, is curved.

b) Bifacially flaked, prepared platform cores;
Initially the nodule is bipolarly split. One half of it is subsequently bifacially flaked around its perimeter. As in a) the evidence of bipolar splitting consists either of the bulb of percussion and/or a central remnant of the split surface. 28

c) 90° platform cores;
Each of these cores has two platforms at right angles to one another. One platform may or may not have been prepared by flakes removed by blows delivered to the other platform. If not, at least one platform in all cases is made on a split (prepared) surface. 8

d) Opposed platform cores;

Flakes were removed from one surface by striking one of two platforms which are opposite one another. In each case one of the platforms is a split surface. 4

e) Multiple platform cores;

Each core has three or more platforms, at least one of which is prepared. 11

III Exploded cores:

I have included here a catch-all category which contains those rocks which when struck, 'exploded' presumably because of properties inherent in that rock, i.e., cleavage planes, faults, etc. The desired flat surface was not the result. Subsequently, three flakes (rarely more) were removed by the knapper who took advantage of more than one of the angles produced by the original blow. This type of core produced few usable flakes and was soon discarded. 15

IV Quarry detritus:

This category includes whole rocks and fragments, spalls and large flakes, exhibiting less than three flake scars. On none of these is there any discernible sign of retouch or utilization. 169

No classification of cores is as precise as this one appears. to be. Cores are remnants of whole rocks from which flakes have been removed, perhaps by more than one technique, evidence for which may be indeterminable. In addition, some specimens defy classification; assigning them membership in any category automatically obliterates other data inherent in the form of the core. Nevertheless, specific patterns of utilization of the lithic resource available at the Ski Hill site do emerge from the preceding classification.

Quartzite, the only suitable material indigenous to the site, occurs in the form of well-rounded pebbles and cobbles. The data from the Ski Hill site suggest that this particular form frequently required that the nodule be split to make a striking platform before efficient flaking could proceed.

If the potential core had a lenticular cross-section, the individual began removing flakes without any preparatory step, as in types I (a), (b), (d). If the cross-section approximated an oval or circle, the nodule was first split. This step produced an edge upon which the knapper could direct subsequent blows, as in types I (c) and II (a), (b).

Morice (op. cit.:40 this paper) describes the method used by the Beaver Indians to split selected nodules. Judging from my own experience with quartzite most of the cores from the Ski Hill site which manifest preparartory splitting required the application of a similar technique.

The large size of many of the fragments contained in the categories Exploded Cores and Quarry Detritus, indicates that they are the result of the unsuccessful application of this technique.

The preceding core classification is confounded somewhat by the fact that some cores may have been utilized as tools as well as sources of flakes. The objective methods of observation available to me were not adequate to establish use unequivocally. Again I have relied on my own judgement in classifying certain specimens as tools rather than as cores. I employed the following criteria: (1) the pattern and distribution of flake scars; (2) the relative size and depth of the flake scars; and (3) the appearance of the edge produced. Also included in this classification are those tools made on spalls, flakes, and split pebbles. The following categories were defined from the materials collected (the number and size range in centimeters of items in each category follow the description):

I Split pebbles and cobbles unifacially retouched to the cortical surface (all those found are of quartzite):

Retouch	Number	Size Range	Median
shallow			
medium	2	5.7 - 13.0	9.85
steep	6	6.6 - 15.5	8.20

One of these displays evidence of resharpening and/or use retouch.

II Spalls and large flakes unifacially retouched to the cortical surface (all those found are of quartzite):

Retouch	Number	Size Range	Median
shallow	4	5.6 - 8.3	7.60
medium	10	5.5 - 12.2	9.60
steep	22	6.3 - 14.0	9.30

Five of these display evidence of resharpening and/or use retouch.

III Spalls and large flakes unifacially retouched to the split surface (all those found are of quartzite):

Retouch	Number	Size Range	Median
shallow	2	7.2 - 12.2	9.70
medium	3	12.7 - 14.5	14.00
steep	4	7.0 - 10.5	9.55

IV Unifacially retouched spalls and flakes backed by a break or by cortex (all those found are of quartzite):

Retouch	Number	Size Range	Median
shallow	1	11.5	
medium	4	11.0 - 15.0	12.85
steep	2	15.0 - 15.5	15.25

V Bifacially retouched spalls and flakes (all those found are of quartzite):

Retouch	Number	Size Range	Median
shallow	3	11.0 - 19.5	17.80

VI Bifacially retouched spalls and flakes backed by a break or by cortex (all those found are of quartzite):

Retouch	Number	Size Range	Median
shallow	7	5.8 - 14.2	12.45

VII Notched split pebbles and cobbles (all those found are of quartzite):

Number	Size Range	Median
7	9.6 - 14.1	13.30

VIII Hammerstones (all those found are of quartzite):

Number	Size Range	Median
31	5.0 - 19.4	8.60

IX Anvilstones (all those found are of quartzite):

Number	Size Range	Median
7	5.0 - 18.3	13.20

X Wedges:

Material	Number	Size Range	Median
Chert	8	2.2 - 3.8	3.00
Quartzite	8	3.0 - 9.0	6.00

XI Unifacially retouched, irregularly shaped flakes:

Material	Retouch	Number	Size Range	Median
Chert	shallow	4	2.7 - 8.0	3.00
	medium	7	3.3 - 4.5	3.90
	steep	5	2.8 - 5.5	3.20
Quartzite	shallow	6	4.1 - 7.7	4.55
	medium	13	3.8 - 8.5	6.00
	steep	9	4.5 - 9.0	5.50

XII Ovoid to circular flakes unifacially flaked around 80% or more of their circumference:

Material	Retouch	Number	Size Range	Median
Chert	steep	8	1.8 - 4.1	2.10
Quartzite	steep	4	2.7 - 3.7	3.00

Five of these display evidence of resharpening and/or use retouch.

XIII Unifaces:

Material	Retouch	Number	Size Range	Median
Chert	medium	3	6.0 - 7.6	7.50
Quartzite	medium	7	2.5 - 12.0	5.50

These figures do not include four unclassifiable fragments.

XIV Bifacially retouched flakes:

Material	Retouch	Number	Size Range	Median
Chert	shallow	3	3.4 - 6.5	6.20
	medium			
	steep	1	2.2	
Quartzite	shallow			
	medium	3	4.1 - 8.0	5.00
	steep			

XV Bifaces:

Material	Retouch	Number	Size Range	Median
Chert	shallow	2	9.3 - 11.3	10.30
Quartzite	shallow	15	3.0 - 12.1	7.00

Seven of these are backed by grinding. These figures do not include 25 unclassifiable fragments.

XVI Total number of unifacially retouched triangular and rectangular scrapers according to the position and incline of the retouch and the type of material used.

		END		SIDE		END & SIDE	
		TRIANGULAR	RECTANGULAR	TRIANGULAR	RECTANGULAR	TRIANGULAR	RECTANGULAR
SHALLOW	CHERT				10		1
	QUARTZITE			3	1		
MEDIUM	CHERT	7		3	3	1	
	QUARTZITE	3	1		3		
STEEP	CHERT	21		1	1	9	2
	QUARTZITE	3	1		1		1

MATERIAL	NUMBER	SIZE RANGE	MEDIAN
Chert	59	1.5 - 6.0	2.51
Quartzite	17	2.5 - 4.2	3.25

Twenty-seven of these display evidence of resharpening and/or use retouch. These figures do not include 23 unclassifiable fragments.

XVII Awls or drills:

Material	Number	Size Range	Median
Chert	4	4.0 - 6.4	4.50
Quartzite	1	4.7	

XVIII Flakes with unifacially retouched graver spurs or tips:

Material	Number	Size Range	Median
Chert	6	2.0 - 7.0	2.75
Quartzite	7	2.3 - 7.0	4.40

XIX Flakes with retouched notches:

Material	Number	Size Range	Median
Chert	3	2.8 - 3.8	3.00
Quartzite	1	5.8	

XX One grooved maul and one flint from a flintlock were among the materials recovered from the surface collection.

XXI Projectile Points:

Sixteen complete projectile points and 54 fragments were recovered from GiQq 301. Six of these were recovered from the excavations, the remainder were found on the surface. Four of the fragmentary points were apparently broken in manufacture. Two other fragmentary points were retouched for use other than as projectiles.

Two factors mitigate against reconstructing archeological cultures on the basis of the projectile points found at this site: (1) with rare exception the projectile points are poorly made and consequently represent considerable variation in form; and (2) the number of projectile points recovered from in situ positions is exceedingly small. The high proportion of broken, asymmetrical or otherwise imperfect points recovered from GiQq 301 reflects the extractive nature of the industry practised at this site. A brief description of the identifiable point types follows.

A single fragment, the base and mid-section of a lanceolate point, was collected from the surface. By accepted morphological standards, this is probably the oldest point form represented at the site. The fragment (Plate 2, a) is made of quartzite, is slightly asymmetrical, and is characterized by

sub-parallel, colateral flaking. The edge of the specimen are not ground.

A single incipient stemmed point was found. This specimen is slightly asymmetrical. The shoulders are only weakly defined; the cross-section is bi-convex; the base is concave. This specimen (Plate 2, b) is made of a variety of black chert.

Three projectile points of the Oxbow type were found on the surface at the site. The largest of these (Plate 2, c) was apparently broken during an attempt to thin a portion of the mid-section. The notches of this point exhibit slight grinding. This specimen is made of quartzite. The remaining two Oxbow points are made of black chert (Plate 2, d and e).

Each of these points exhibits grinding and polishing on the edges of the base and notches.

The base only of a single, parallel-sided, concave based point was found. This fragment vaguely resembles the McKean point type (Wormington and Forbis, 1965:30). The specimen (Plate 2, f) is made of quartzite and exhibits no grinding.

The base and mid-section of a point which most closely approximates the Hanna point type was found (Ibid.:30). The fragment (Plate 2, g) is made of quartzite, is asymmetrical and exhibits no grinding.

The remainder of the projectile points from the surface collection are roughly divided into cornor-notched (h through k, Plates 2 and 3) and side-notched points (l through , Plate 3). Considerable variation of form is exhibited within these two general types. The sample recovered is not large enough to be used in defining sub-types.

Two complete points and one fragment were recovered from Test Trench 1 (Plate 4, a, b, c).

A small, shallowly side-notched point (a) made of quartzite was found at the base of the Ah horizon, four centimeters below the surface. The base and notches of this point exhibit ground edges.

A small stemmed point (b) made of chert was found ten centimeters below the surface in the A horizon. The edges of this point are very sharp except on the stem where it has been dulled by pressure flaking.

The base of a lanceolate point (c) was found 15 centimeters below the surface on the contact between the A and B horizons. The basal edges of this point are slightly ground.

Three projectile points were recovered from Excavation Area 1 (Plate 4, a, b, c).

A chert bipoint (a) with one tip missing was recovered from the southwest quarter of pit B3,

seven and one half centimeters below, the surface in the A horizon. This point has a lenticular cross-section, has very sharp edges, and lacks grinding

A small, triangular, side-notched point (b) of quartzite was recovered from the southeast quarter of pit B2, ten centimeters below the surface in the A horizon. All edges of this point are ground.

An Oxbow point (c) made of chert was found ten centimeters below the surface in the A horizon of pit D2. The notches have been ground and polished.

Summary and Interpretation

The preceding classification reveals something of the pattern of utilization of lithic materials at this site. All artifacts in those classes with median sizes greater than 7.6 centimeters are made of quartzite. In only two instances, unifaces and bifacially retouched flakes, does the median size of the chert specimens exceed that of the quartzite specimens. In each instance there are fewer than five chert specimens of the tool type. I believe that if these tool types were better represented, the median size of the chert tools would fall below that of the quartzite tools.

In all instances where the median size of a tool type is smaller than three centimeters the number of chert specimens recovered is greater than the number of quartzite specimens. Where the median size is larger than 7.5 centimeters, the number of quartzite specimens is greater than

centimeters, the number of quartzite specimens is greater than the number of chert specimens. I suggest that this size range at its upper limit reflects the maximum size of the pieces of chert available, and at the lower limit a cultural preference for chert over quartzite because of the superior flaking qualities of the former material.

The large number of cores from the ploughed field, the amount of flaking debitage found in Excavation Area 1, and the number of tools broken in manufacture all suggest that a primary reason for occupying this site was for the manufacture of stone tools. The fact that many of the retouched flakes in the preceding classification exhibit evidence of resharpening and/or use retouch (multiple steps on the retouched surface above the bit edge), and of use (grinding, polishing) suggests that the inhabitants were working materials such as bone or wood as well as stone.

No microblades or microcores were recovered from the Ski Hill site, nor were they found at any of the sites located on the Saddle Hills survey.

Dating of none of the aforementioned point types in northern Alberta is secure. It is still necessary to rely on dates associated with similar assemblages from other areas. In this connection I will discuss only that point form most assuredly represented at GiQq 301, the Oxbow point.

The Oxbow component was first defined at the Oxbow

Dam site in southern Saskatchewan where it was dated at 3250 B.C. ± 130 (S-44). The same component at the Long Creek site near Estavan, Saskatchewan was associated with three dates, 2700 B.C. ± 150 (S-53), 2670 B.C. ± 150 (S-50), and 2670 B.C. ± 80 (S-52) (W. C. Noble, 1971:106). The Oxbow component at the Moon Lake site in southern Saskatchewan was dated at 3033 B.C. ± 90 (Meyer and Dyck, 1968:8).

In Alberta, Oxbow points from the Castor Creek site, 80 miles east of Red Deer were associated with a date of 2525 B.C. ± 1000 years (Wormington and Forbis, 1965:188).

Oxbow points were found in several levels at the Fullerton site in the Peace Hills, near Wetaskiwin, Alberta. In the lowest levels Oxbow points were found in association with Scottsbluff points and in the upper levels with Prairie Side-notched points (Taylor, 1969).

Concerning the distribution through time of the Oxbow and Parkdale Eared points, Taylor (1969:114) states:

> A long life-span for this general point type was also indicated at the Fullerton site, as it occurred in all levels, though being most common in levels C, D, and E (ca. 2-5,000 years B. P.).

Taylor (1969) postulates a 'grassy parkland' environment in the area throughout this time period. Bison, elk, beaver and moose were identifie from among the faunal remains associated with Oxbow points. Other stone tools associated with the Oxbow points include: McKean points, cornor-notched points, one stemmed point, pointed biface tools, awls,

spokeshaves, and "split-pebble cutting and scraping tools" (Taylor, 1969). Each of these tool types was recovered from the Ski Hill site as well. The artifact assemblages from levels C, D, and E at the Fullerton site do not differ significantly from the total artifact collection from the Ski Hill site and may represent common life-styles under similar environmental conditions.

The Ski Hill site materials are similar to the artifacts recovered from two sites excavated in the area west of Edmonton by Timothy Losey. Losey (1971:143) describes techniques of removing flakes from well rounded pebbles and cobbles used at the Stony Plain quarry site that are similar to those used at GiQq 301. Other tool types, cobble spalls, unifaces, bifaces, retouched and utilized flakes, are also common to both sites. These classes of artifacts, however, are ubiquitous in Alberta and therefore shed little light on the nature of inter-site relations. The similarities in core techniques manifest at the two sites probably reflect work in a common form of raw material rather than any "genetic" relationship between the assemblages.

Similarly the materials from the Cormie Ranch site are broadly comparable to those from the Ski Hill site. Losey (1972, Fig. 12) illustrates eight projectile points from level 3 which were associated with dates of 2540 B.C. ± 190 years and 2050 B.C. ± 120 years (Losey, 1972:19). These points display a variety of forms similar to the side-notched

points from the Ski Hill site. However, subtypes of small corner-notched and side-notched points have not been strictly defined in northern Alberta, and as gross types are not sufficiently restricted in space and time in the archeological record to be meaningful in determining inter-site relations over such a broad area.

Lithic materials similar to those from the Ski Hill site, including "Oxbow-like and McKean-like points" and a variety of side- and corner-notched points, were recovered by Dr. R. Gruhn from GhPh 102, 50 miles north of Athabasca, Alberta. Unfortunately Gruhn (1969:10) encountered problems similar to those at the Ski Hill site in distinguishing cultural assemblages:

> Although the variety of artifact forms, in particular the projectile point forms, might suggest a long period of occupancy and perhaps the presence of several different assemblages, there is no physical basis for so sorting the entire collection of cultural materials.

Although the cultural materials from GhPh 102 are similar to those from the Ski Hill site, the topographic locations of the two sites are significantly different. GhPh 102 islocated on a terrace formed by till above the present level of Calling Lake. Moose and northern pike have been identified from among the faunal remains recovered at the site (Gruhn, 1969). GhPh 102 also was likely a quarry site utilizing quartzite cobbles on the adjacent beach, as cores and flakes are abundant (Gruhn, per. comm., 1973).

Three Oxbow components have been identified in the

Northwest Territories: at the Loon Lake site and at the Quarry site southeast of Great Slave Lake, and at Fisherman Lake near Fort Liard (W. C. Noble, 1971:106-07).

> Millar estimates this component of his Fish Lake complex to date between 1000 - 700 B.C. This seems rather late in view of the 3250 B.C. ± 130 (S-44) date from the Oxbow type site . . . A date falling between 2500 - 1500 B.C. is suggested here for Oxbow components in the southern Territories to account for temporal lag in a postulated south to north diffusion of the complex.

Hopefully future archeological research in the Peace River country, an intermediate area, will yield absolute dates on specific components and shed some light on the problems of diffusion of particular archeological cultures.

In this regard, the results obtained by Dr. A. L. Bryan from the Karpinsky site (GkQn 100) near Wanham, Alberta suggest a north to south diffusion of a late prehistoric component. The projectile points recovered from the Karpinsky site are typologically similar to those from the Taltheilei type site in the Northwest Territories (W. Irving, per. comm., 1972).

Taltheilei points were originally considered by MacNeish to be very early, ca. 7000 years (MacNeish, 1951:41). Noble (1971:111) postulates a much later date for this complex:

> Clearly, Taltheilei materials elevated 54-57 feet on eastern Great Slave Lake follow the 61-68 foot elevated MacKinlay River complex. Typological seriation also indicates that it is separate from, but closely follows Hennessey. Unfortunately, there are no radiocarbon determinations for Taltheilei sites on Great Slave Lake,

but McGhee's date of A.D. 160 ± 70 (S-465) from the northerly Sandwillow site is extremely useful and convincing. A date of A.D. 100 - 300 for Taltheilei does not seem unreasonable.

The Taltheilei complex is one of a series of 10 complexes constituting the Taltheilei Shale Tradition. Noble (1971:111) suggests that this tradition spans the period from ca. 200 B.C. to A.D. 1830 and ". . . terminates with the historic Yellowknife (Copper) Indians".

Wright (1972:83-84) suggests that the Chipewyan Indians shared the same cultural tradition:

> Recent survey work along the north shore of Lake Athabasca in northern Saskatchewan has also produced Taltheilei Shale tradition sites and the available radiocarbon dates from northern Saskatchewan and northern Manitoba are in approximate agreement with Noble's radiocarbon dates and seriation estimates, particularly with reference to the latter half of the tradition. Northern Saskatchewan, northern Manitoba, and central and southern Keewatin District were occupied historically by the Chipewyans or Caribou Eaters. This fact suggests that the Yellowknife and the Chipewyan shared a basically similar cultural tradition; a situation that is not at variance with available linguistic and ethnological evidence.

Bryan (per. comm., 1973) obtained a radiocarbon date of 1070 (A.D. 880) ± 55 years (S-517) on a sample associated with the cultural materials from the Karpinsky site. The projectile points from the Karpinsky site are typologically distinct from those found at the Ski Hill site and from those observed by the present writer in private collections in the south Peace River country. It is not unreasonable to suggest that the Karpinsky site represents a late prehistoric intrusion of people from the north. Further research

is required to substantiate this hypothesis.

There are no apparent relationships between diagnostic artifacts from the Peace River country and the late prehistoric artifacts illustrated by Dr. C. E. Borden (1952:42-43) from west of the continental divide in central British Columbia. Similarly, prehistoric artifacts illustrated by Paul Donahue (1971:16-17) from two sites on the West Road River in central British Columbia are typologically distinct from the Ski Hill site materials.

Farther south on the Fraser River, between Lillooet and Lytton, Dr. D. Sanger excavated a house pit at the Lochnore Creek site, which was dated about 2600 years B. P. (Sanger, 1970:104). One projectile point in particular looks vaguely similar to the Oxbow type (ibid., Fig. 21b), but the majority of points from Lochnore Creek are quite different from those found at the Ski Hill site. Apparently, there is very little similarity between archeological materials from either side of the Rocky Mountains, although more work in both areas may prove this conclusion to be premature.

CHAPTER V

CONCLUSIONS

The area here defined as the Peace River country is a distinctive environmental region; an area of parkland surrounded by boreal forest. Slight palynological evidence accumulated to date indicates that this condition has prevailed more than once since deglaciation.

Glacial and post-glacial deposition has affected the nature of archeological sites found in this region. Lithic raw materials are not generally distributed on surfaces formerly covered by proglacial lakes, below approximately 2550 feet ASL. This resource is concentrated, however, in upland areas. Well rounded quartzite pebbles and cobbles do occur in concentrations in upland areas, particularly along the brink of the hills. The Beaver Indians frequented quarries, such as these areas provided, in proto-historic times in order to maintain their supply of stone tools (Morice, 1894, op. cit.:40).

I have argued that the Ski Hill site was utilized as a quarry workshop by prehistoric inhabitants on the bases of: (1) the number of cores and of tools related to knapping, that is, hammerstones and anvilstones, collected; (2) the high proportion of broken (unclassifiable) tools; (3) the nature and distribution of cultural materials exposed in

Excavation Area 1.

On the basis of his observations of materials from three quarry sites in the southern United States, Kirk Bryan (1950:35) states:

> The existence on the quarry debris of a multitude of utilized flakes and roughly formed implements suitable for working on wood and bone has been established. Thus these quarries and, by inference, many others were not only sources of flint tools, but also factories for the fabrication of an unknown array of objects of wood and bone.

Similarly, well rounded and resharpened edges on many of the cutting and scraping tools from GiQq 301 indicate that in addition to stone, materials such as bone, antler, horn, and wood were worked at this site.

The form of the lithic resource available at the Ski Hill site frequently determine the procedure involved in obtaining flakes from a nodule. Analysis of the cores from GiQq 301 indicates that nodules with a circular cross-section were split before flaking proceeded. The Beaver technique of splitting nodules described by Morice (1894, op. cit.:40) was probably used under these circumstances by all prehistoric inhabitants.

Black chert was used in preference to quartzite at GiQq 301 for small tools. Data from the Ski Hill site and vicinity indicate that the varieties of chert used are not locally available; that is was obtained in pebble form from sources we have not yet located. Considerable economy was exercised in the use of chert; no whole pebbles of the

varieties used were recovered from the site.

We located three specific activity areas at GiQq 301: (1) A utilized cache of lithic materials in Test Trench 1; (2) A hearth surrounded in part by clusters of flakes in Excavation Area 1; (3) A disturbed hearth identified from the complete surface collection. The activities which took place around the excavated hearth included the manufacture of bifaces and splitting of small pebbles.

Field research provided no reliable data upon which to base an estimate of the population density and distribution at the Ski Hill site through time. The full dimensions of the site are not yet known. Excavation of test pits between areas of apparent artifact concentrations revealed that these areas are not isolated; that the distribution of cultural materials is continuous over an area of at least one quarter square mile.

Only very extensive excavations and/or thorough sampling over a large area would establish whether or not cultural assemblages are horizontally distinct. I do not believe significant data would be lost were this accomplished using the shovel and screen technique.

Future Research

The present research has defined some problems concerning the prehistory of the Peace River country and has left unsolved many more. Certainly the most significant contribution still to be made is the location and excavation

of a stratified archeological site.

Surveys conducted to date on the plains and in the uplands of the Peace River country have not accomplished this end. Surveys of portions of the Peace River valley, by R. McGhee in the early 1960's (the collection from which were lost in a boating accident), and by J. V. Wright and W. Noble in 1964 have been unsuccessful as well. Rapid downcutting, consequent slumping and dense vegetation cover severely limit accessibility in the major river valleys of this area. Areas which should receive the attention of future surveys include the flood plains of smaller rivers and streams, and lake shores.

A stratified site might provide, in addition to identifiable artifact assemblages, the basis for establishment of an obsidian hydration rate for this area. Obsidian hydration may be the most reliable means of dating sites such as GiQq 301 given the problems involved in securing a reliable carbon sample from very shallow sites.

The relative advantages of the parkland ecotone of the Peace River country to its inhabitants in terms of food resources must have been significant prior to the extinction of the buffalo. Available ethnographic reports provide little information concerning the exploitation of this resource by the Beaver Indians. Archeological sites containing buffalo bones are known in this region. The only means of assessing the importance of this additional resource to prehistoric

inhabitants lies in the excavation of these sites. Similarly, excavation of sites located around lakes such as Sturgeon Lake and Lesser Slave Lake may shed some light on the role of fish in the economy of prehistoric inhabitants and ultimately on the relationship between these sites and those in other physiographic zones.

Archeologists have in the past found reason to criticize the premature establishment of "cultural sequences". Ultimately many of these schemes have proven misleading and a source of embarrassment to their authors.

Prior to the establishment of such a sequence it is imperative that we be able clearly to differentiate between sites and artifact assemblages which represent part of the pattern of exploitation of the resources available in an area by a single population and those which indeed represent an influx of new ideas and/or people. This distinction necessarily requires a background of competent archeological research, a backlog which for the Peace River country does not exist.

In this paper therefore, I have concentrated on identifying some of those patterns of utilization of a particular resource imposed on prehistoric populations of the Peace River country by the natural environment. Hopefully, this is the direction archeological research in this area will take at least until some of those gaps in our present knowledge discussed in the preceeding paragraphs are

filled.

It is not unreasonable to suggest even now, on the basis of data from the Karpinsky site and the Ski Hill site, that the Peace River country was subject to influences both from the north and from the Plains. Further research will eventually establish the nature of those influences.

The available radiocarbon dates from farther south in Alberta and in Saskatchewan associated with projectile point types similar to those recovered from the Ski Hill site suggest that the major utilization of the Ski Hill quarry site was during the third millennium B.C., although probably it continued to be used afterwards.

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REGIONAL MAP DELIMITING SURVEY AREA

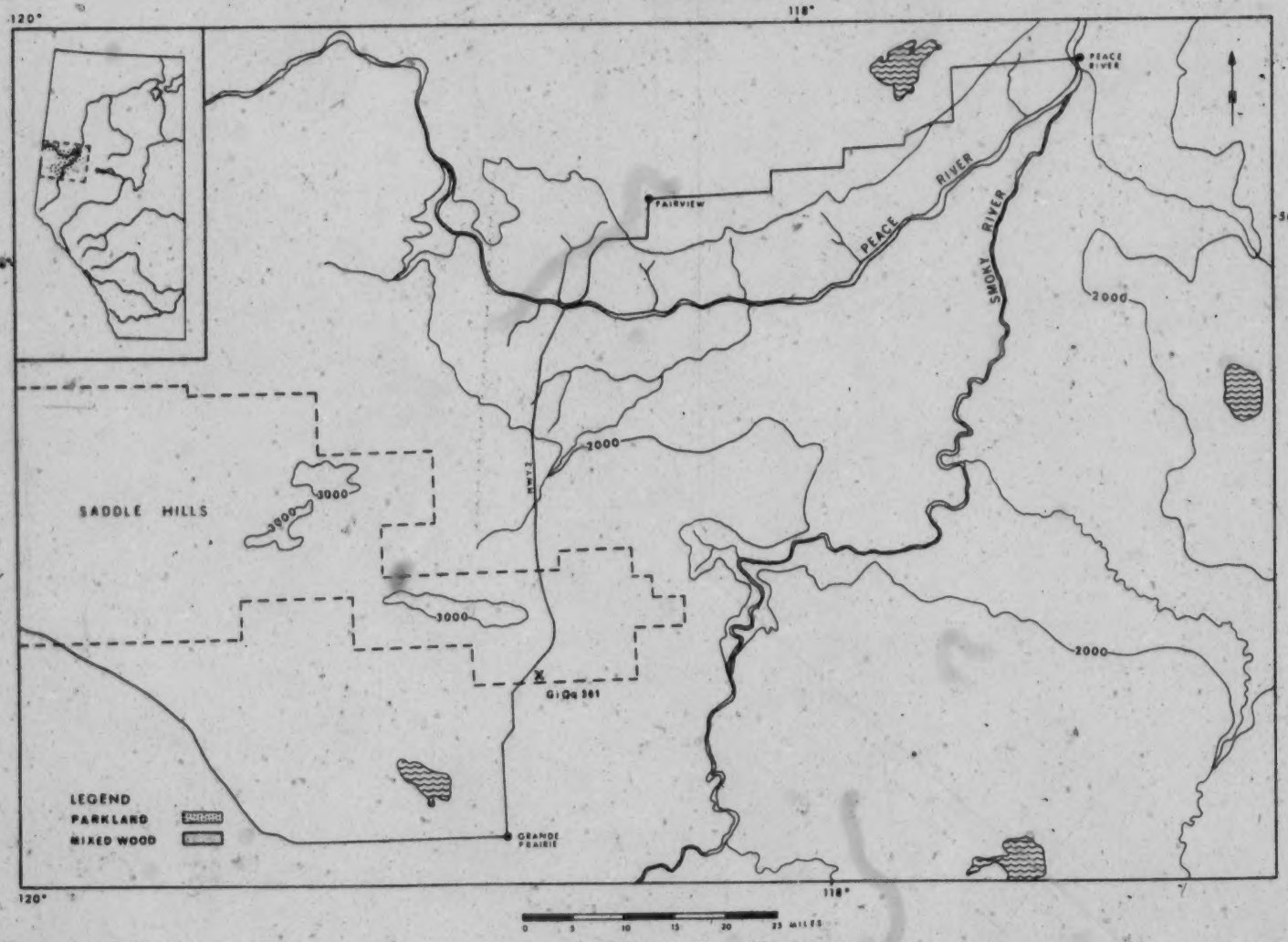


Figure 1

SITES LOCATED ON 1969 SURVEY

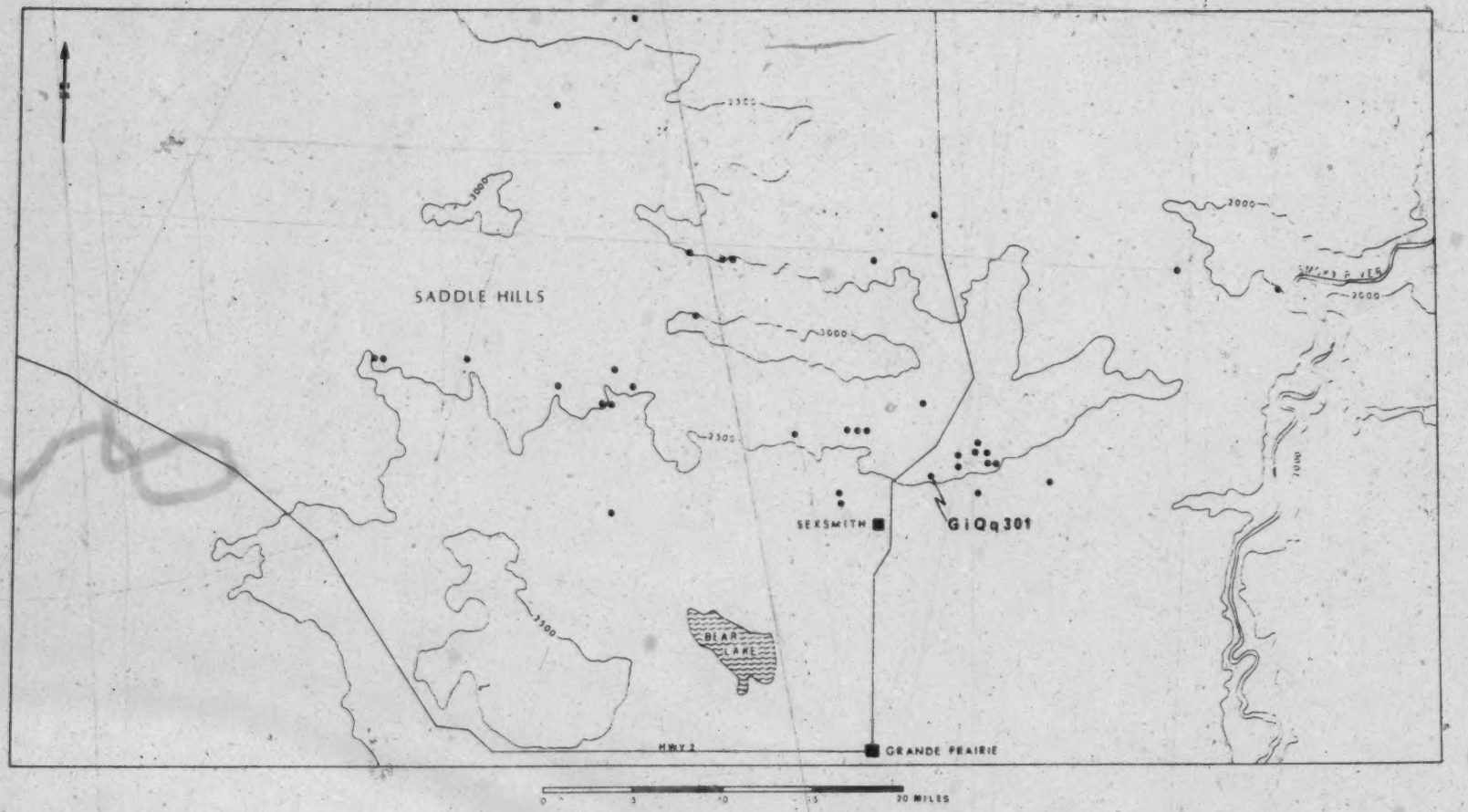


Figure 2

SITE GlQq301

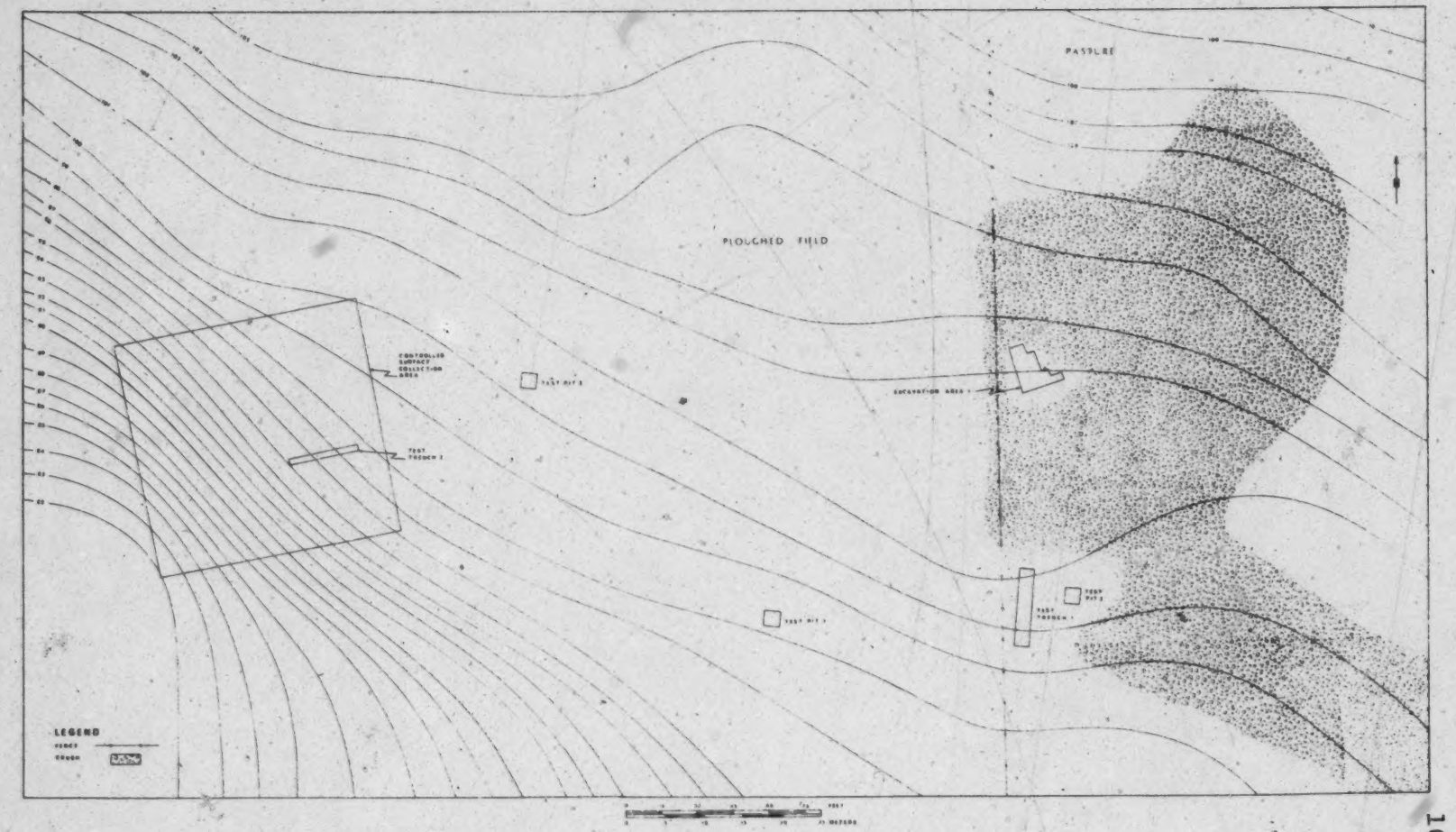


Figure 3

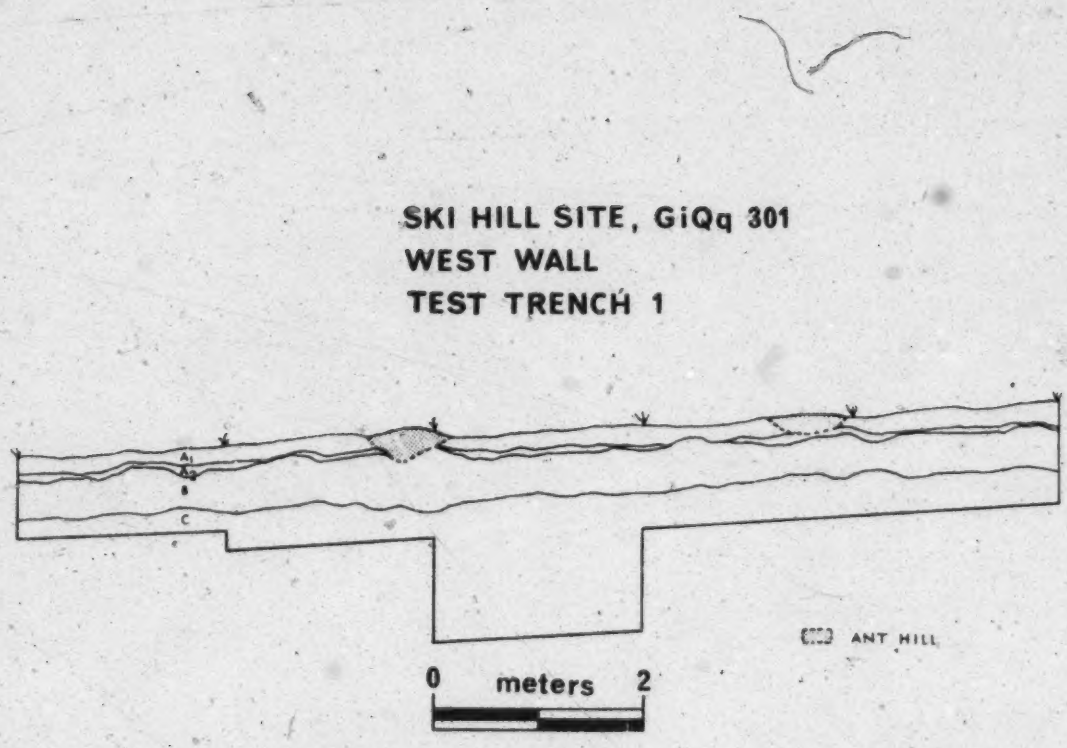

SKI HILL SITE, GiQq 301
WEST WALL
TEST TRENCH 1
A1
A2
B
C
ANT HILL
0
meters
2

Figure 4

PLAN VIEW OF EXCAVATION AREA 1

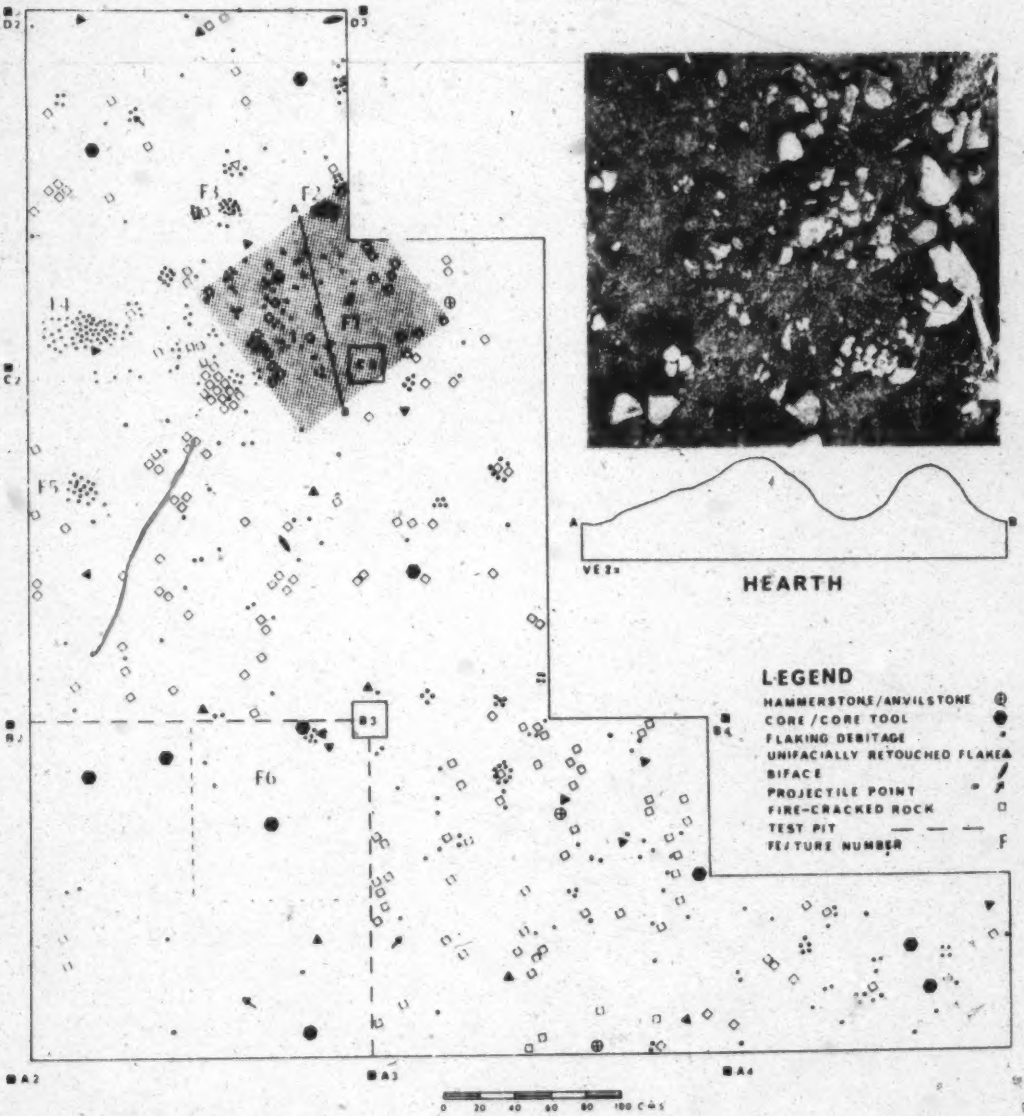


Figure 5

LEGEND

Hammerstone/Anvilstone . . . . . ⊗

Core/Core Tool . . . . . ⬢

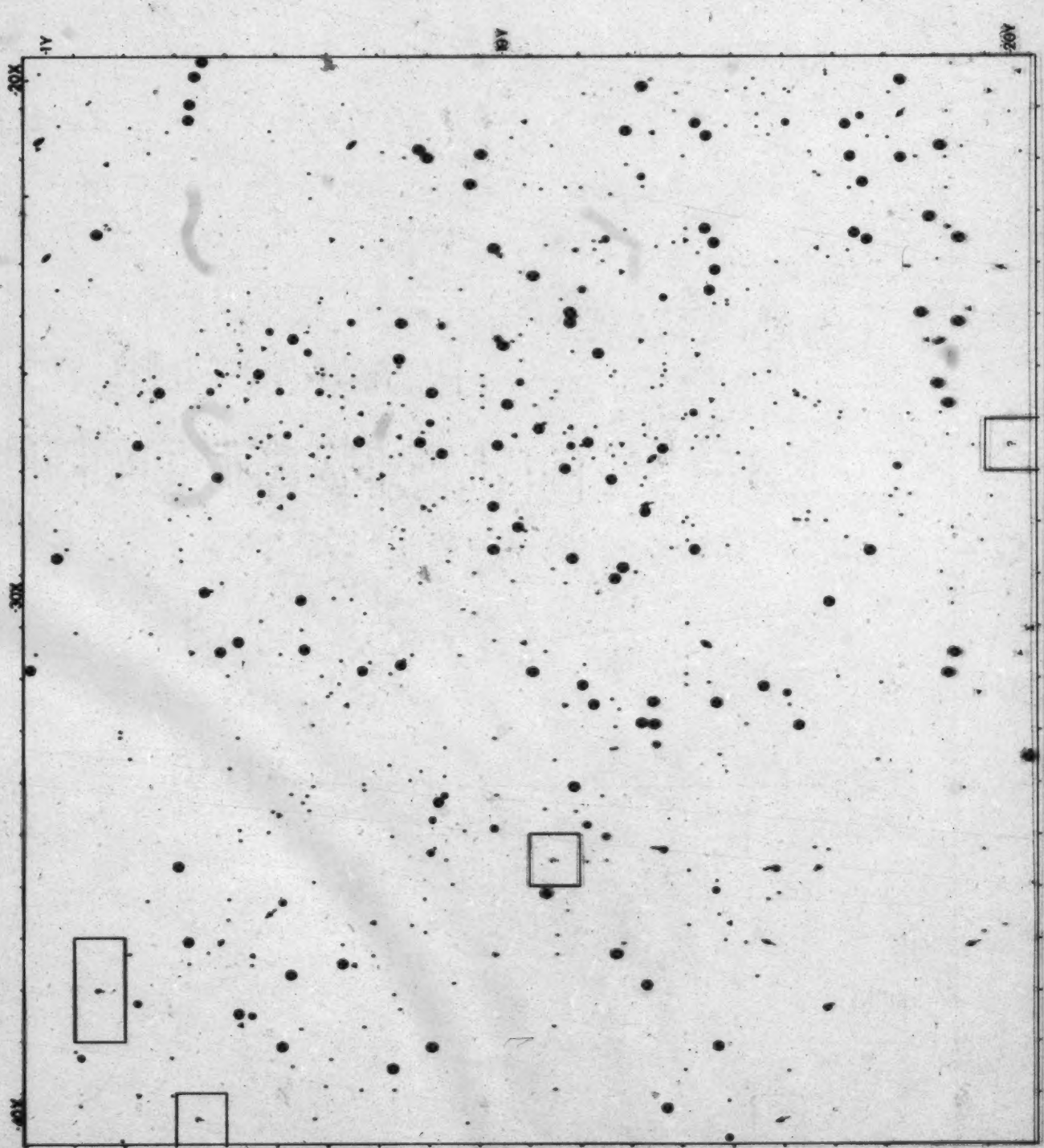
Flaking Debitage . . . . . •

Unifacially Retouched Flake . . . . . ▲

Biface . . . . . ⬬

Projectile Point . . . . . ↗

Fire-Cracked Rock . . . . . □


-1Y
0Y
20Y
20X
30X
40X

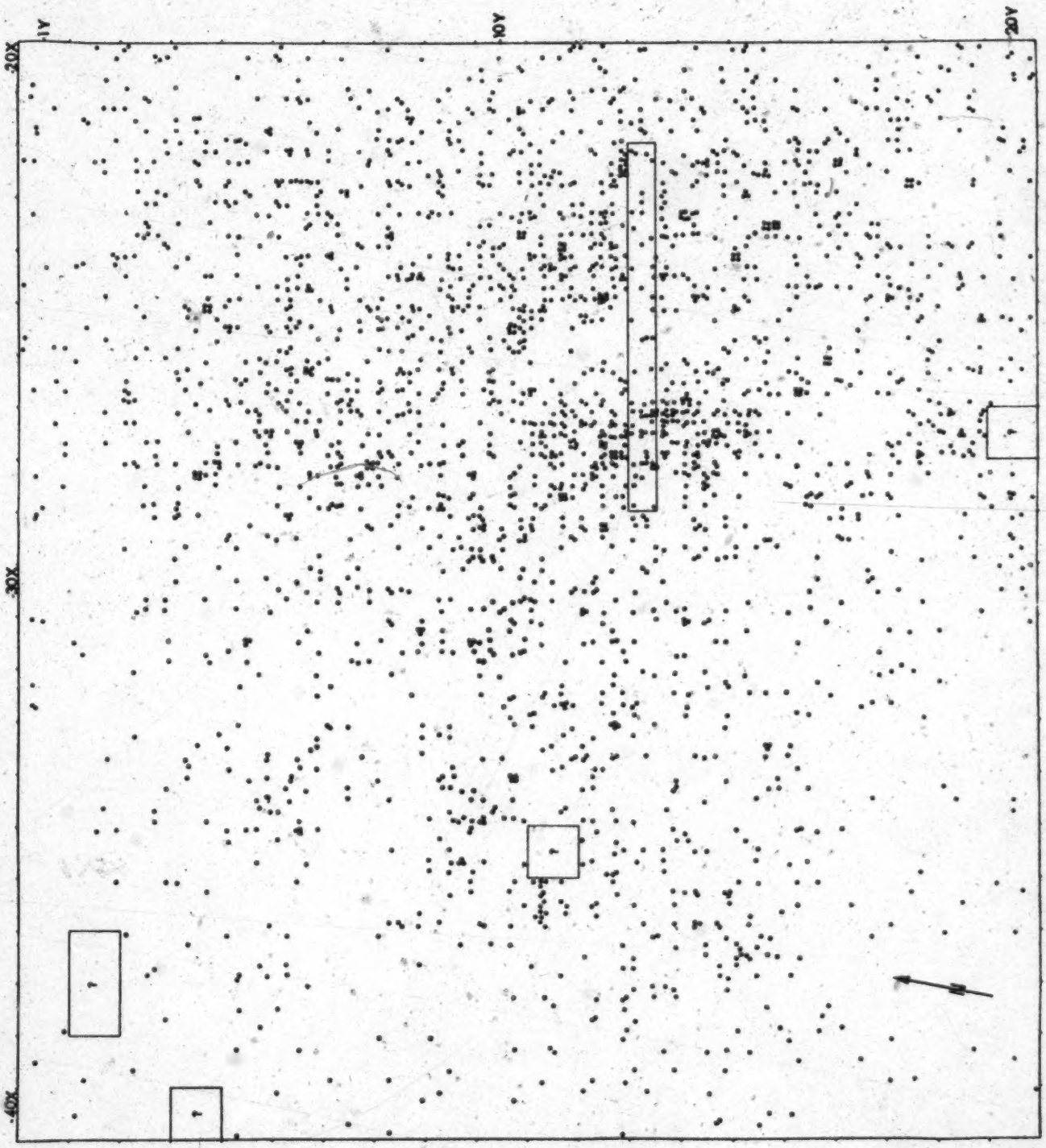


Figure 6

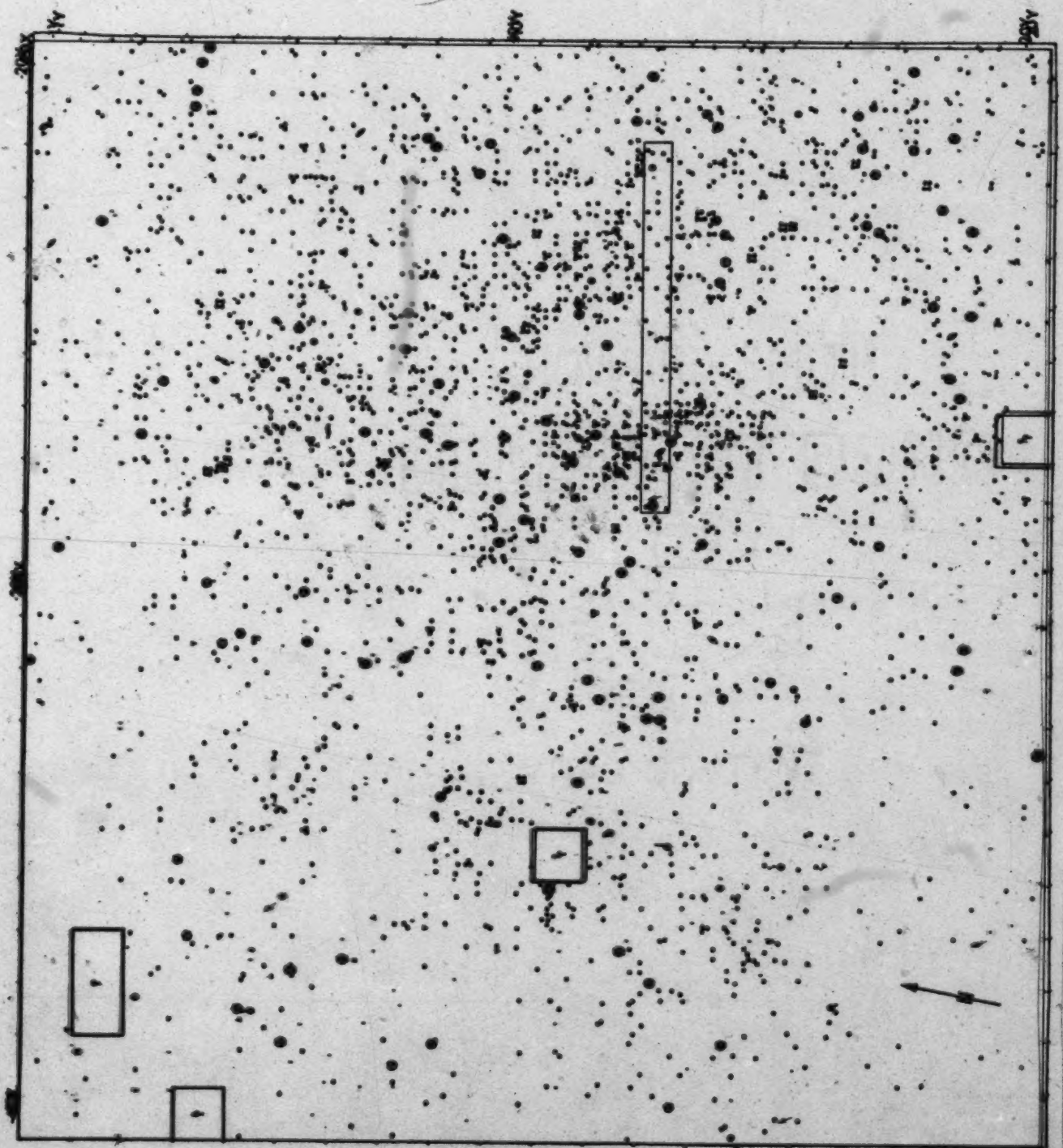


Figure 6

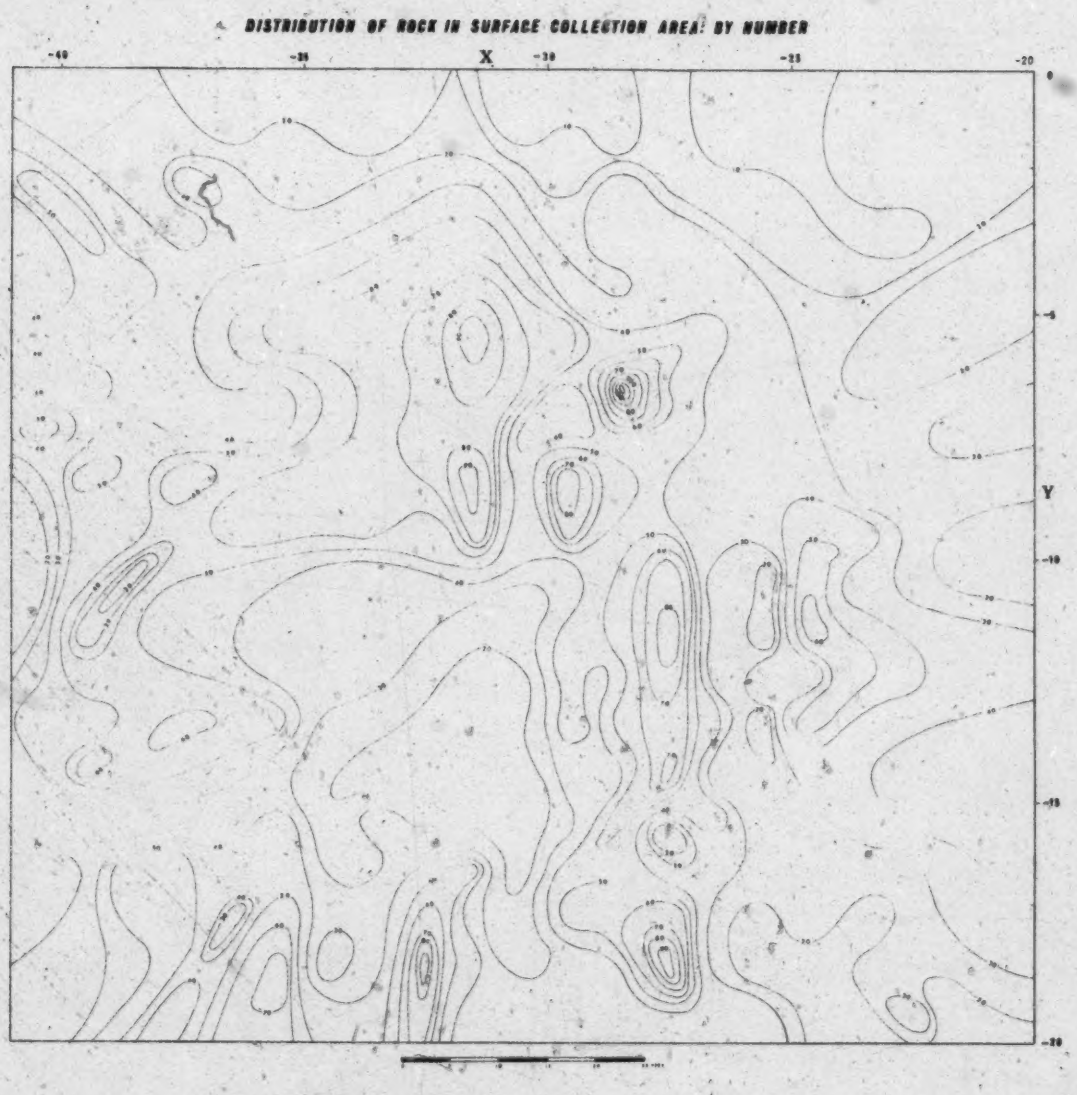

DISTRIBUTION OF ROCK IN SURFACE COLLECTION AREA BY NUMBER
X
Y

Figure 7

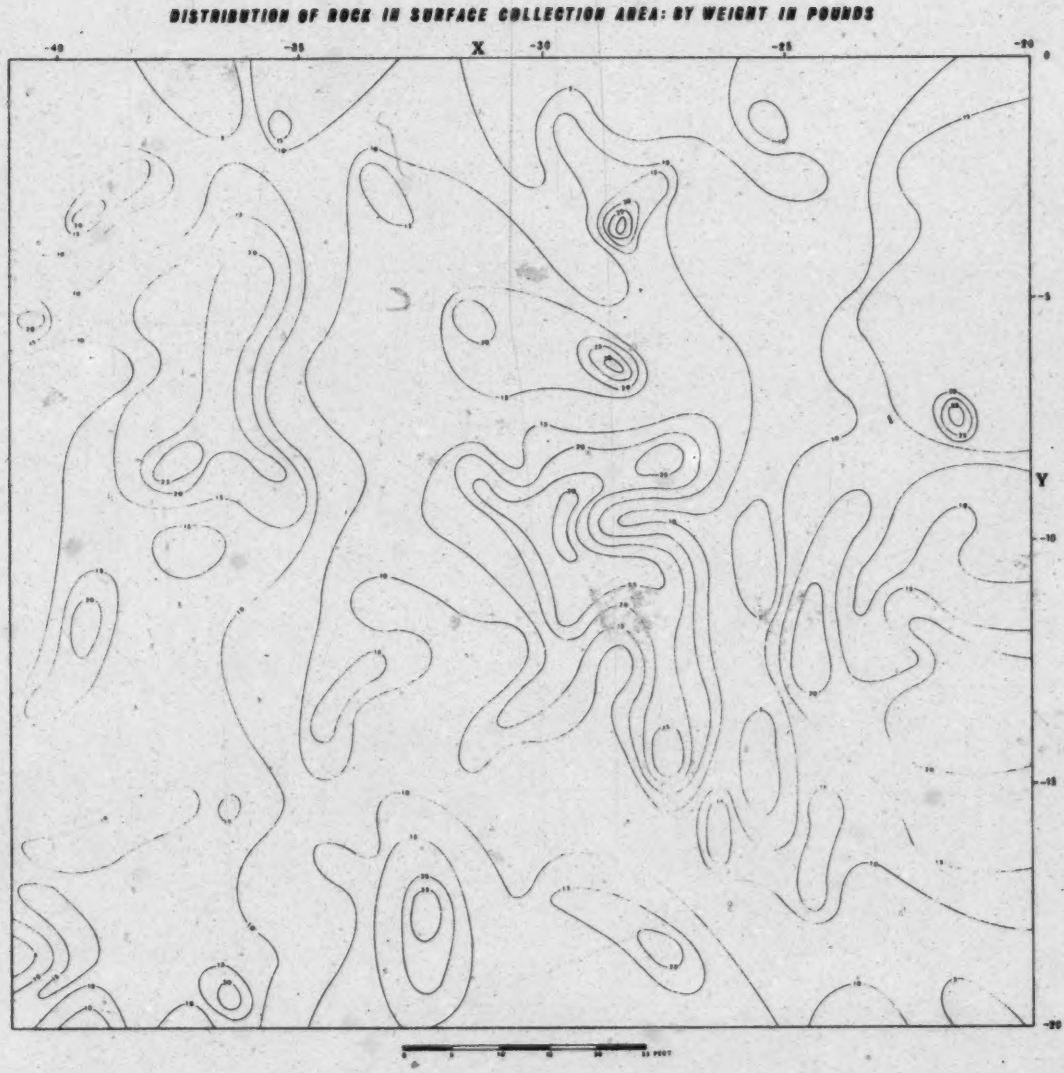

DISTRIBUTION OF ROCK IN SURFACE COLLECTION AREA: BY WEIGHT IN POUNDS
X
Y

Figure 8

DISTRIBUTION OF FLAKED STONE, FIRE-CRACKED ROCK AND BONE
IN TEST TRENCH 2 BY EXCAVATION UNITS

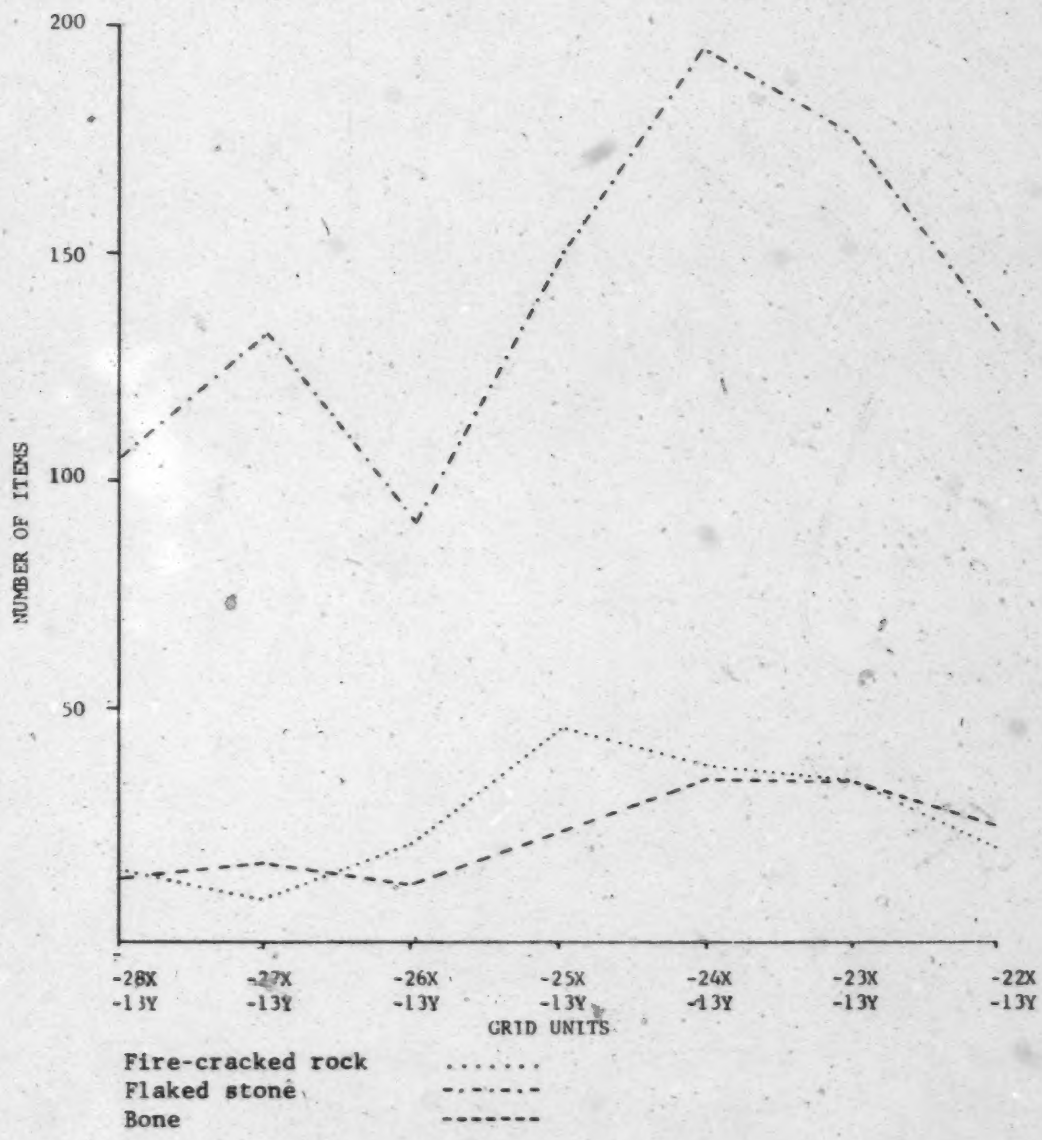
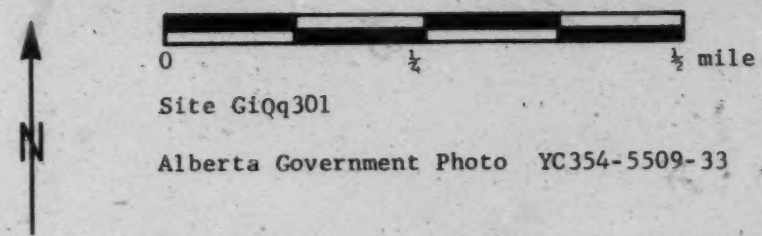


Figure 9

SITE AND ENVIRONS



Site GiQq301

Alberta Government Photo YC354-5509-33

Plate 1

Projectile Points from Surface Collection
a through i

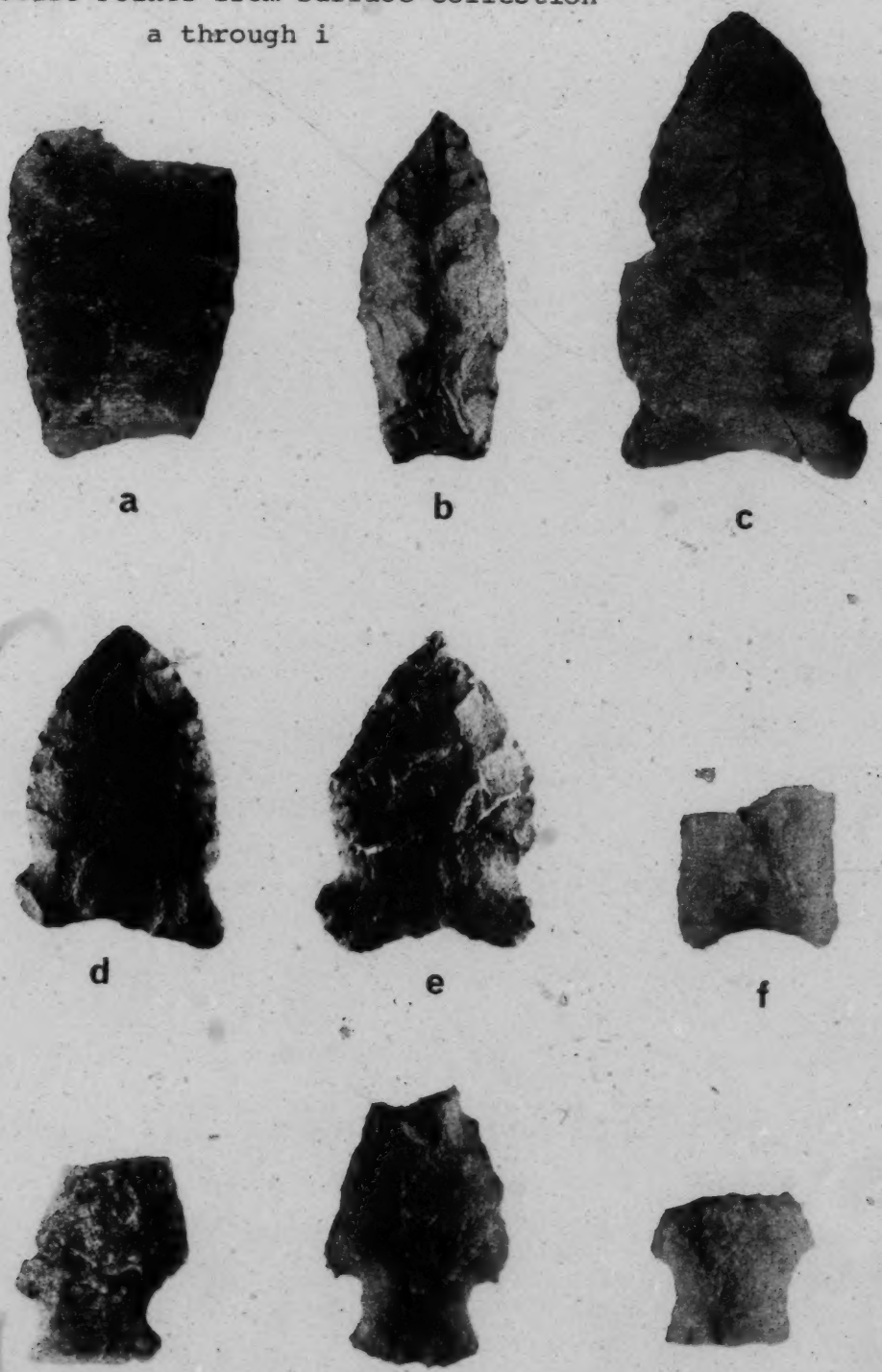
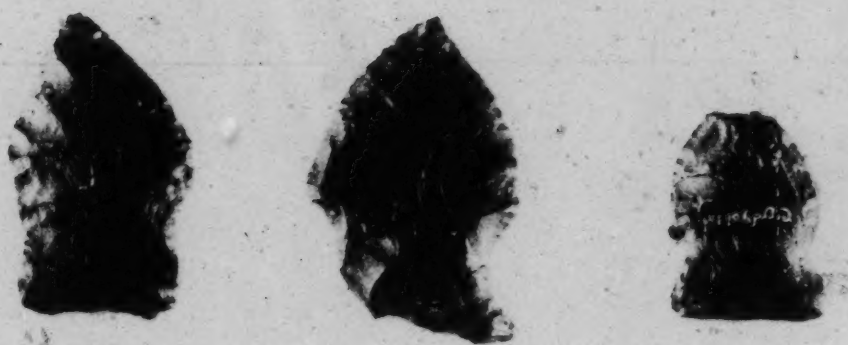


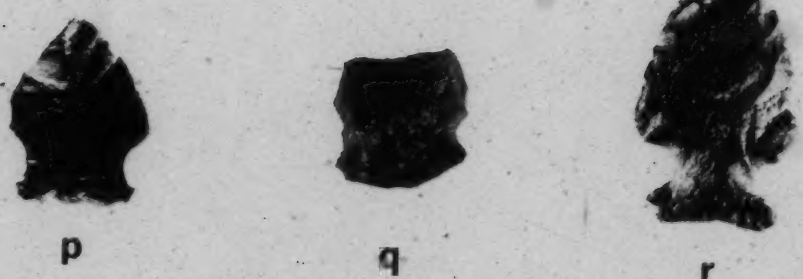
Plate 2

Projectile Points from Surface Collection: j through r

j k l



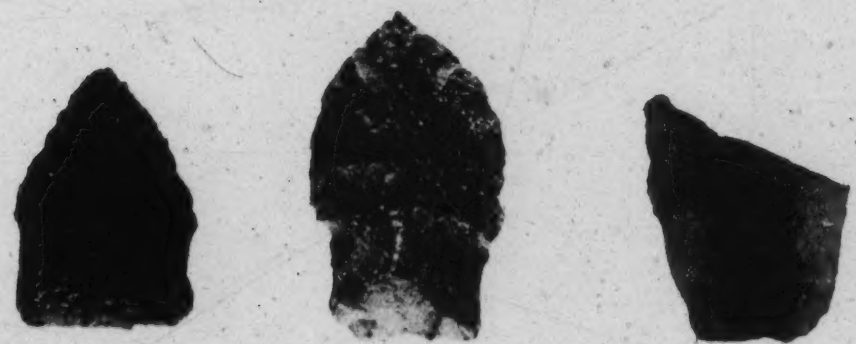
m n o



p q r

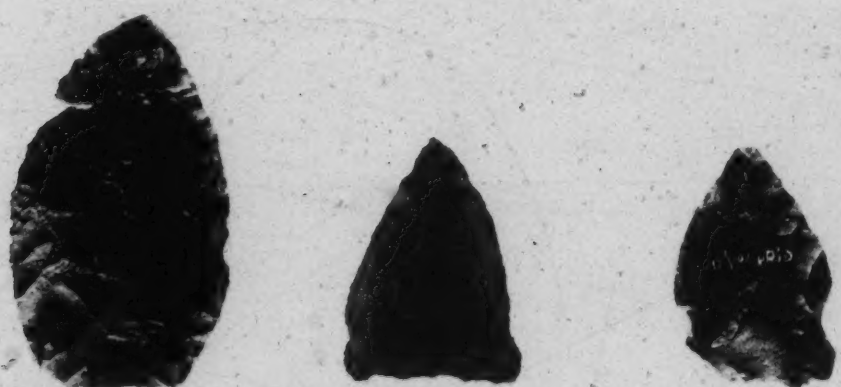
Plate 3

Projectile Points from Test Trench 1: a through c



a b c

Projectile Points from Excavation Area 1: a through c



a b c

Plate 4